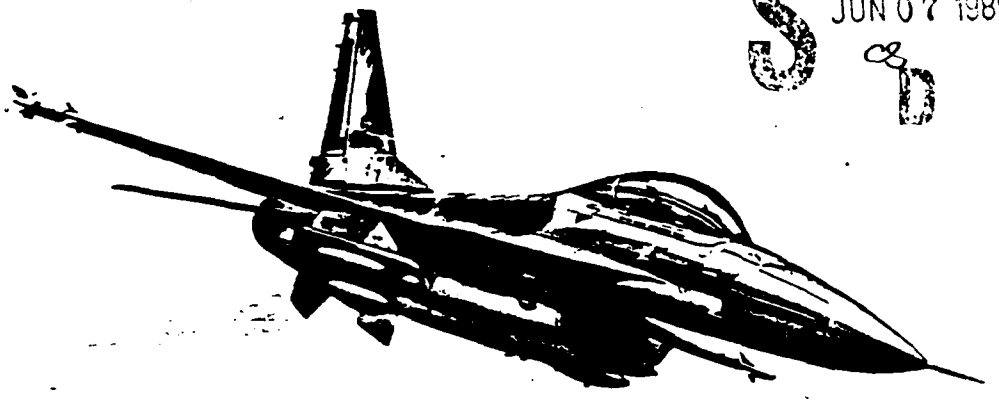
Tracor

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM



PHASE 3 PROPOSAL
CATEGORY 1 PROJECT
COUNTERMEASURES ASSEMBLY IMPROVEMENTS

MAY 24, 1985

INDUSTRIAL
TECHNOLOGY MODERNIZATION
PROGRAM

unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION: unclassified	1b. RESTRICTIVE MARKINGS: None
2a. SECURITY CLASSIFICATION AUTHORITY: ~~Tracor~~	3. DISTRIBUTION / AVAILABILITY OF REPORT: Unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE: None	
4. PERFORMING ORGANIZATION REPORT NUMBER(S): Tracor Proposal 905-0163	5. MONITORING ORGANIZATION REPORT NUMBER(S): 888840G TR88-0264
6a. NAME OF PERFORMING ORGANIZATION: Tracor Aerospace; 6b. OFFICE SYMBOL (If applicable):	7a. NAME OF MONITORING ORGANIZATION: General Dynamics/Fort Worth
6c. ADDRESS (City, State, and ZIP Code): Austin, TX 78725	7b. ADDRESS (City, State, and ZIP Code): Fort Worth, TX 76101
8a. NAME OF FUNDING / SPONSORING ORGANIZATION: F-16 SPO; 8b. OFFICE SYMBOL (If applicable): ASD	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER: Contract# F33657-80-G-0007; P.O. # 1005205
8c. ADDRESS (City, State, and ZIP Code): Dayton, OH 45433	10. SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Phase 2 Final Project Report - Countermeasures Assembly Improvements

12. PERSONAL AUTHOR(S)
Russ Petrie

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 1-1-85 TO 5-24-85	85,05,24	71

16. SUPPLEMENTARY NOTATION
CDRL ITM-004

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	
13	09		Countermeasures Assembly

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This project will improve material handling, kitting set-up, and product flow where provided in the assembly of countermeasures systems.

The improved assembly system will relocate the stockroom, provide work-station portable carts, facility layout and new revised assembly fixtures. Training of personnel in the use of application of improved techniques and methods.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT: ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION: Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL: Captain Curtis Britt	22b. TELEPHONE (Include Area Code): (513) 258-4263; 22c. OFFICE SYMBOL: YPTM

DD FORM 1473, 84 MAR — 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
unclassified

Boeing Aerospace

SRAM-A Support Program
P. O. Box 3999
Seattle, WA 98124-2499

Engineering Report (U)

Started Under

Engineering Assignment Number 87-7-1-12

And Completed Under

Engineering Assignment Number 88-7-5 And 89-1

TITLE: "HELIUM BOTTLE PRESSURE MEASUREMENT BY PORTABLE ULTRASONIC TECHNIQUE"

Contract Number: F34601-84-C-1068 AND F34601-88-D-0987

Release Date: 7 February 1989

AGM-69A

The information reported in this document is being supplied to MMHRMB, Oklahoma City Air Logistics Center (OC-ALC), Tinker Air Force Base, OK 73145, under Government contract number shown above; however, it does not necessarily bear the endorsement of the agency.

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Tracor Aerospace
Aerospace Austin

PHASE III PROPOSAL
CATEGORY 1 PROJECT
COUNTERMEASURES ASSEMBLY IMPROVEMENTS

TRACOR PROPOSAL 905-0163

SUBMITTED TO:

General Dynamics Corporation
Fort Worth Division
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Fort Worth, Texas 76101

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A-1

May 24, 1985

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LIST OF ILLUSTRATIONS

TECH MOD COUNTERMEASURES ASSEMBLY IMPROVEMENTS

1.0 INTRODUCTION

The objective of this project has been to design, develop, and implement a plan of improving all aspects of the Countermeasures Assembly procedure. This project included the stockroom, staging area, and the assembly area. The initial data and ideas were outlined about three years ago and have been further defined and developed in this project.

1.1 Countermeasures Area Description

The Countermeasures Assembly area produces four basic products with each basic product having variations. The four basic products are the Programmer Assembly, Dispenser Assembly, Electromagnetic Interference (EMI) Filter, and the Dispenser Control Panel Assembly (Cockpit Control).

Initial analysis of the assembly area and its related areas identified six areas of improvement. These areas of improvement include:

1) Stockroom location
2) Method of pulling kit parts in the stockroom
3) Staging room methods and location
4) Workstation concept and setup
5) Material handling equipment
6) On-line testing

Once the areas of improvement were identified, further investigation and development was pursued. The results of this investigation and development effort are presented in the following pages.

1.2 AS IS Assessment

Stockroom

The Countermeasures stockroom is located in Building 2. A layout showing the stockroom in Building 2 and the assembly area in Building 8 is presented in Figure 1-1. All parts and materials from Receiving Inspection are identified and stored in the stockroom. The material is stored in bin-shelves by part number sequence.

Stockroom personnel use Quota Pull Requests (Figure 1-2) to kit all parts. A preprinted tag (Figure 1-3) is issued with the Quota Pull Request for each part listed. The stockroom person reads the Quota Pull Request and writes down the required parts on scrap paper. The person searches for the proper shelf(shelves), pulls as many part bins as can be carried, and returns to the desk. The person then performs the following operations:

1) Opens the parts package from the bin.
2) Counts the required number of parts.
3) Reseals the parts package from the bin.
4) Puts the required number of parts in a plastic bag.
5) Seals the plastic bag.
6) Puts a preprinted label on the plastic bag.
7) Sets the bag of parts in a box.
8) Marks the part off the Quota Pull Sheet.
9) Repeats steps 1-8 for each part pulled.

The stockroom person then returns the part bins to the shelves and repeats the process until the Quota Pull Request is completed. When the kit is completed, it is set in a storage

area to be picked up by a Production Coordinator. A Flow Process Chart is presented in Figure 1-4.

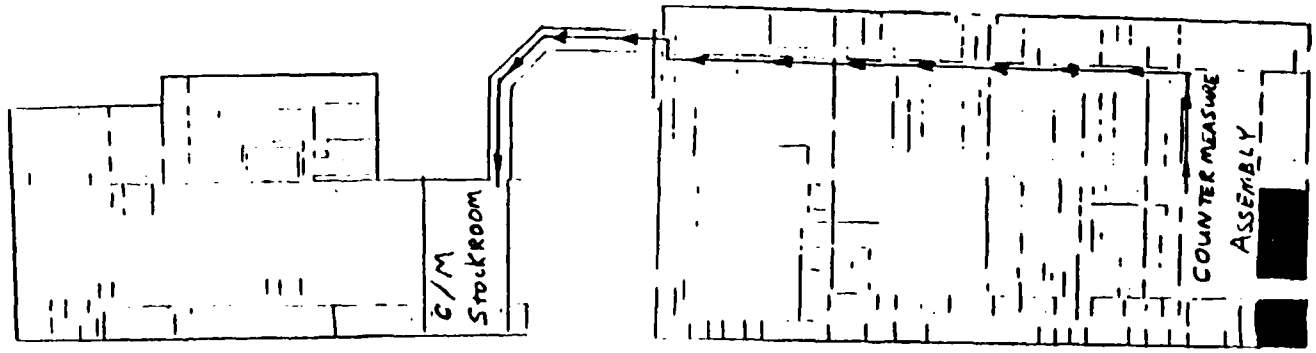


Figure 1-1. STOCKROOM/COUNTERMEASURES ASSEMBLY AREA LAYOUT

AEROSPACE GROUP MATERIAL REQUISITION / TRANSFER ORDER NEED DATE: 03/22/85 MT-H16140 PAGE OF

ISSUED BY: DATE: REQUESTED BY: 807 DATE: 03/15/85

POSTED BY: DATE: RECEIVED BY: DATE: APPROVED BY: DATE:

REMARKS:

QUOTA PULL FOR P/N 141587-0005 QTY TO BUILD 50
REVISION: ECO #: 0-9999

UNIT S/N ASSY; PWO:
004/141587-0005 /JA1271
FROM ACCOUNT NO TO ACCOUNT NO
206-000 75 48 046-004 75 50

TRANSACTION INFORMATION

SEQ	PART NUMBER	UP	U/M	DESCRIPTION	PO/PWO	QC	QTY REQ'D	QTY AVAIL	QTY ISSUED	UNIT PRICE	TOTAL PI
73	24750-0333		EA	RES CMPSN 33K			450.000	450.000			
75	24750-0334		EA	RES CMPSN 330			450.000	450.000			
77	24750-0335		EA	RES CMPSN 3.3			150.000	150.000			
101	24750-0470		EA	RES CMPSN 47			50.000	50.000			
79	24750-0473		EA	RES CMPSN 47K			300.000	300.000			
56	24750-0511		EA	RES CMPSN 510			300.000	300.000			
81	24750-0681		EA	RES CMPSN 680			300.000	300.000			
[illegible]	24750-0470		EA	RES CMPSN 47			300.000	300.000			
[illegible]	[illegible]-0002		EA	INDUCTOR RF [illegible]			50.000	50.000			
22	24[illegible]-0027		EA	CAP CER .0027			150.000	150.000			
23	24[illegible]-0050		EA	CAP CER .0010			150.000	150.000			

Figure 1-2. QUOTA PULL REQUEST EXAMPLE

PWO/NO JA1271
P/N 24750-0473 SEQ 74
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0334 SEQ 65
QTY 450.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0303 SEQ 61
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0222 SEQ 94
QTY 300.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC,

PWO/NO JA1271
P/N 24750-0681 SEQ 81
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0470 SEQ 101
QTY 50.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0333 SEQ 73
QTY 450.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0272 SEQ 83
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0183 SEQ 62
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0511 SEQ 56
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0335 SEQ 72
QTY 150.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0332 SEQ 75
QTY 900.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0271 SEQ 80
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271
P/N 24750-0152 SEQ 64
QTY 300.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

Figure 1-3. PREPRINTED TAG LIST

FLOW PROCESS CHART

QUESTION EACH DETAIL

NO _____

PAGE 1 OF 4

JOB Kitting Parts in Stockroom (6 parts)

☒ MAN OR ☐ MATERIAL John Condon

CHART BEGINS _____

CHART ENDS _____

CHARTED BY GD DATE 2/8/85

SUMMARY

	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS	69					
⇨ TRANSPORTATIONS	32					
□ INSPECTIONS						
D DELAYS	3					
▽ STORAGES						
DISTANCE TRAVELED		FT		FT		FT.

DETAILS OF (PRESENT / PROPOSED) METHOD	Operation	Transportation	Inspection	Delay	Storage	Distance in Feet	Quantity	Time Min	Action: Eliminate	Action: Combine	Action: Change: Sequence	Action: Change: Place	Action: Change: Person	Action: Improve	NOTES
1 Receive Quota Pull Sheet	●	⇨	□	D	▽			2							
2 Write down parts on scrap paper	●	⇨	□	D	▽				X						
3 Walk to Shelf	○	➡	□	D	▽			3							3 min divided by 20 steps = 0.15 min/step
4 Pull part bin	●	⇨	□	D	▽										6 part average
5 Walk to shelf	○	➡	□	D	▽										
6 Pull part bin	●	⇨	□	D	▽										
7 Stack part bin in hands	●	⇨	□	D	▽				X						
8 Walk to shelf	○	➡	□	D	▽										
9 Pull part bin	●	⇨	□	D	▽										
10 Stack part bins in hands	●	⇨	□	D	▽				X						
11 Walk to shelf	○	➡	□	D	▽										
12 Pull part bin	●	⇨	□	D	▽										
13 Stack part bins in hands	●	⇨	□	D	▽				X						
14 Walk to shelf	○	➡	□	D	▽										
15 Pull part bin	●	⇨	□	D	▽										
16 Stack part bins in hands	●	⇨	□	D	▽				X						
17 Walk to shelf	○	➡	□	D	▽										
18 Pull part bin	●	⇨	□	D	▽										
19 Stack part bins in hands	●	⇨	□	D	▽				X						
20 Walk back to desk	○	➡	□	D	▽										
21 Set bins down on desk in order	●	⇨	□	D	▽										
22 Sit down at desk	○	⇨	□	➡	▽				X						
23 Pick up part out of 1st bin	○	➡	□	D	▽			1.8							1.8 min divided by 11 steps = 0.16 min/step
24 Open package	●	⇨	□	D	▽										part

Figure 1-4. KITTING PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____ PAGE 2 OF 4

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	POSSIBILITIES: ELIMINATE	COMBINE	SEQUENCE	RANGE: PLACE	STOCK	IMPROVE	NOTES
Count required number of parts	●	⇨	□	D	▽										
Reseal package in bin	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										
Put part in plastic bag	●	⇨	□	D	▽								X		
Seal plastic bag with stapler	●	⇨	□	D	▽							X			
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on plastic bag	●	⇨	□	D	▽								X		
Put plastic bag into kit box	○	◆	□	D	▽							X			
Pick up part out of 2nd bin	○	◆	□	D	▽			1.8							
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										
Put part in plastic bag	●	⇨	□	D	▽								X		
Seal plastic bag with stapler	●	⇨	□	D	▽							X			
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on plastic bag	●	⇨	□	D	▽								X		
Put plastic bag into kit box	○	◆	□	D	▽							X			
Pick up part out of 3rd bin	○	◆	□	D	▽			1.8							
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										
Put part in plastic bag	●	⇨	□	D	▽								X		
Seal plastic bag with stapler	●	⇨	□	D	▽							X			
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										

Figure 1-4. KITTING PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____ PAGE 3 OF 4

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	POSSIBILITIES: ELIMINATE	COMBINE	SIMPLIFY	CHANGE SEQUENCE	CHANGE PLACE	CHANGE PERSON	NOTES
Put preprinted tag on plastic bag	●	⇨	□	D	▽									X	
Put plastic bag into kit box	○	◆	□	D	▽						X				
Pick up part out of 4th bin	○	◆	□	D	▽			1.8							
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										
Put part in plastic bag	●	⇨	□	D	▽									X	
Seal plastic bag with stapler	●	⇨	□	D	▽						X				
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on plastic bag	●	⇨	□	D	▽									X	
Put plastic bag into kit box	○	◆	□	D	▽						X				
Pick up part out of 5th bin	○	◆	□	D	▽			1.8							
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										
Put part in plastic bag	●	⇨	□	D	▽									X	
Seal plastic bag with stapler	●	⇨	□	D	▽						X				
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on plastic bag	●	⇨	□	D	▽									X	
Put plastic bag into kit box	○	◆	□	D	▽						X				
Pick up part out of 6th bin	○	◆	□	D	▽			1.8							
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin	○	◆	□	D	▽										

Figure 1-4. KITTING PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____
PAGE 4 OF 4

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	POSSIBILITIES: ELIMINATE	COMBINE	SEQUENCE	PLACE	PERSON	IMPROVE	NOTES
Put part in plastic bag	●												X		
Seal plastic bag with stapler	●								X						
Mark paperwork	●														
Peel preprinted tag from sheet	●														
Put preprinted tag on plastic bag	●												X		
Put plastic bag into kit box	○	◆							X						
Stand up	○		◆					2	X						2.0 min divided by 16 steps - 0.12 min/step 6 part average
Stack bins	●								X						
Walk to Shelf	○	◆							X						
Put 1st bin on shelf	●														
Walk to bin	○	◆							X						
Put 2nd bin on shelf	●														
Walk to shelf	○	◆							X						
Put 3rd bin on shelf	●														
Walk to shelf	○	◆							X						
Put 4th bin on shelf	●														
Walk to shelf	○	◆							X						
Put 5th bin on shelf	●														
Walk to shelf	○	◆							X						
Put 6th bin on shelf	●														
Return to desk	○	◆													
Sit down	○		◆						X						
	○														
	○														
	○														
	○														
	○														
	○														
	○														

Figure 1-4. KITTING PARTS IN STOCKROOM

Production Coordinator - Stockroom to Staging Area

The Production Coordinator makes four trips daily or as required to pick up kits in the Building 2 stockroom. The coordinator delivers the kits by portable cart to the kit staging room in Building 8 (see Figure 1-1). The round trip is approximately 1200 feet and averages 12 minutes per trip.

Staging Room Procedures

One of two clerks uses the Quota Pull Request to verify the accuracy of the kitted parts. All parts, except weighed hardware, are physically counted to insure accuracy. This requires the kit parts to be emptied from the box, verified, and repacked into the box. The parts are then stored on shelves and logged into a kit log. A Shortage Sheet is sent to the planners. The planners track the parts on the Shortage Sheet and have them delivered to the staging area where they are mated with the respective kit. A Flow Process Chart is presented in Figure 1-5.

Production Coordinator - Staging Room to Workstation

After the planners have reconciled shortages, a PWO is sent to the Production Coordinator. The coordinator, upon receipt of the PWO, logs the kit out of the staging room and delivers it to the assembly area. A Flow Process Chart is presented in Figure 1-6.

Assembly Area

The working supervisor uses the PWO Instruction Sheets to stage kitted parts, materials, and tools at the workstations. This requires sorting through the kitted parts,

emptying the parts into storage containers, and identifying which part belongs at each workstation. Each storage container must be properly identified with the item number and part number by use of a tag which is attached to the container. The workstation location varies depending upon production requirements. A Flow Process Chart is presented in Figure 1-7.

Assembly personnel use the Parts List attached to the PWO Instruction Sheets to verify the parts and quantities. The assembly operator proceeds with the assembly operations using the PWO Instruction Sheets as a guide.

Assembly work that must be inspected is recorded in an inspection log by a group leader. This log contains the date, PWO number, part number, quantity, operation number, and location, which are used by inspectors to locate the assemblies.

The group leader informs the Production Coordinator of assemblies that are ready for test or burn-in. The coordinator transports the assemblies on a portable cart and places them on incoming shelves located in test and burn-in. The coordinator also retrieves tested and burned-in assemblies from the shelves and transports them to the proper assembly workstation.

Rework from inspection, test, or burn-in is returned to the assembly area where it is repaired and reprocessed through inspection and test operations.

Completed subassemblies are taken by the Production Coordinator to the staging room where they are stored until kitted for final assembly.

Completed final assemblies (LRU's) are delivered by the Production Coordinator to a staging area to wait for Government Inspection (DCASMA) or Customer Inpection (CSI). After the inspection approval, the Production Coordinator delivers the LRU's to the Shipping Department.

Tools & Testing Equipment

The Countermeasure assemblies require typical electronic assembly equipment, tools, and methods. The PWO Instruction Sheets specify the assembly method, sequence of assembly, and tools required. The following are typical tools and equipment used during the process: soldering equipment; hot air blowers; screwdrivers; pliers; harness boards; arbor presses; allen, socket, and open-end wrenches; riveting tools; and continuity testers.

Manufacturing Test Procedures, Acceptance Test Procedures, and Burn-in Test Procedures are used by the Test and Burn-in Departments in the performance of their specific tasks. These procedures are used in conjunction with special test equipment, Thermotron units, and holding fixtures to perform the functions descibed in the procedures.

FLOW PROCESS CHART

QUESTION EACH DETAIL

NO ____
PAGE 1 OF 1

JOB Staging Parts/Verifying Quantities

[X] MAN OR [ ] MATERIAL ____

CHART BEGINS ____

CHART ENDS ____

CHARTED BY GD DATE 2/8/85

SUMMARY

	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS	6					
⇨ TRANSPORTATIONS	5					
□ INSPECTIONS	3					
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

	DETAILS OF (PRESENT/PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ACTION: ELIMINATE	ACTION: COMBINE	ACTION: CHANGE: SEQUENCE	ACTION: CHANGE: PLACE	ACTION: CHANGE: PERSON	ACTION: IMPROVE	NOTES
1	Get kit box of parts	○	→	□	D	▽			.15 K-1	X						
2	Remove paperwork from kit box	○	→	□	D	▽			.16 K-2	X						
3	Remove parts from kit box	○	→	□	D	▽			.25 K-3	X						
4	Organize parts on table	●	⇨	□	D	▽			.50 K-4	X						
5	Verify sequence number	○	⇨	■	D	▽			.45 K-5	X						
6	Verify P.O. number	○	⇨	■	D	▽			.05 K-6	X						
7	Verify quantity	○	⇨	■	D	▽			.10 K-7	X						All parts other than hrdw is recounted by hand
8	Mark paperwork	●	⇨	□	D	▽			.15 K-8	/						
9	Put part back in kit box	○	→	□	D	▽			.15 K-9	X						
10	Organize paperwork	●	⇨	□	D	▽			.25 K-10	X						
11	Put shortage sheet in planner box	○	→	□	D	▽			.15 K-11							
12	File computer card (location card)	●	⇨	□	D	▽			.15 K-12							
13	Log kit into staging area	●	⇨	□	D	▽										
14	Store kit on shelf	●	⇨	□	D	▽			.12 K-14	X						
15		○	⇨	□	D	▽										
16		○	⇨	□	D	▽										
17		○	⇨	□	D	▽										
18		○	⇨	□	D	▽										
19		○	⇨	□	D	▽										
20		○	⇨	□	D	▽										
		○	⇨	□	D	▽										
22		○	⇨	□	D	▽										
23		○	⇨	□	D	▽										
24		○	⇨	□	D	▽										

Figure 1-5. STAGING PARTS/VERIFYING QUANTITIES

FLOW PROCESS CHART

QUESTION EACH DETAIL

NO _____
PAGE 1 OF 1

JOB Production Coordinator

[X] MAN OR [ ] MATERIAL _____
CHART BEGINS _____
CHART ENDS _____
CHARTED BY GD DATE 2/8/85

SUMMARY

	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS	5					
⇨ TRANSPORTATIONS	4					
□ INSPECTIONS						
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME Min.	ACTION: ELIMINATE	ACTION: COMBINE	ACTION: CHANGE SEQUENCE	ACTION: CHANGE PLACE	ACTION: CHANGE PERSON	ACTION: IMPROVE	NOTES
1	Receive PWO	●	⇨	□	D	▽			2							
2	Walk to staging area	○	➡	□	D	▽										
3	Log out kit	●	⇨	□	D	▽										
4	Walk to shelf	○	➡	□	D	▽										
5	Pull kit	●	⇨	□	D	▽										
6	Carry kit to work area	○	➡	□	D	▽										
7	Set kit in work area	●	⇨	□	D	▽										
8	Walk to desk	○	➡	□	D	▽										
9	Log kit movement in status log	●	⇨	□	D	▽										
10		○	⇨	□	D	▽										
11		○	⇨	□	D	▽										
12		○	⇨	□	D	▽										
13		○	⇨	□	D	▽										
14		○	⇨	□	D	▽										
15		○	⇨	□	D	▽										
16		○	⇨	□	D	▽										
17		○	⇨	□	D	▽										
18		○	⇨	□	D	▽										
19		○	⇨	□	D	▽										
20		○	⇨	□	D	▽										
21		○	⇨	□	D	▽										
22		○	⇨	□	D	▽										
23		○	⇨	□	D	▽										
24		○	⇨	□	D	▽										

Figure 1-6. PRODUCTION COORDINATOR

FLOW PROCESS CHART

ANALYZE WHY? QUESTION EACH DETAIL

NO ____
PAGE 1 OF 1

JOB Sorting Parts for Workstation

[X] MAN OR [ ] MATERIAL Working Supervisor
CHART BEGINS ____
CHART ENDS ____
CHARTED BY GD DATE 2/11/85

SUMMARY

	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS	4					
⇨ TRANSPORTATIONS	1					
□ INSPECTIONS	1					
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ACTION: ELIMINATE	COMBINE	CHANGE: SEQUENCE	CHANGE: PLACE	CHANGE: PERSON	IMPROVE	NOTES
1 Empty box onto table	●	⇨	□	D	▽			.42							
2 Sort per workstation	●	⇨	□	D	▽			.50							
3 Open package	●	⇨	□	D	▽			.37							
4 Verify part	○	⇨	■	D	▽			.40							
5 Put part back in bag	●	⇨	□	D	▽			.22							
6 Put in workstation storage container	○	➡	□	D	▽			.37							
7	○	⇨	□	D	▽										
8	○	⇨	□	D	▽										
9	○	⇨	□	D	▽										
10	○	⇨	□	D	▽										
11	○	⇨	□	D	▽										
12	○	⇨	□	D	▽										
13	○	⇨	□	D	▽										
14	○	⇨	□	D	▽										
15	○	⇨	□	D	▽										
16	○	⇨	□	D	▽										
17	○	⇨	□	D	▽										
18	○	⇨	□	D	▽										
19	○	⇨	□	D	▽										
20	○	⇨	□	D	▽										
21	○	⇨	□	D	▽										
22	○	⇨	□	D	▽										
23	○	⇨	□	D	▽										
24	○	⇨	□	D	▽										

Figure 1-7. SORTING PARTS FOR WORKSTATION

2.0 PROJECT DESCRIPTION

The basic improvement areas are listed below. A more detailed list describing the improvement procedures and the benefits of each change also follows this list of improvement areas.

1) Relocate the Countermeasures stockroom in Building 8 adjacent to the assembly area.

2) Eliminate extra steps in the stockroom by using modified preprinted labels and carts with storage containers.

3) Eliminate the audit count in the staging room and bring the staging room under the control of the Production Coordinator.

4) Eliminate labeling part containers by the working supervisor.

5) Reduce assembly time and rework time while increasing efficiency by using a Cablescan Continuity Monitor/Tester.

2.1 Proposed Improvements

Departmental Layout

A departmental layout analysis was made to determine the most efficient location for the departments concerned with production. The analysis was based on the four basic products and the flow through departments during assembly. Figure 2-8 shows the resulting Departmental Process Layout. A high correlation exists between assembly, quality control, stockroom, and test. The assembly and quality control areas are so interrelated, they are shown in one area intermixed. The stockroom and test areas are also required to be adjacent to the

assembly area due to the high correlation of material flow through the departments.

Assembly Layout

A layout of the assembly area was prepared. Figure 2-9 shows the basic layout. Note the designated cart storage areas located next to the aisles of the assembly area. These storage areas will leave the required aisle space required by safety.

Staging Room

The staging room will be located in Building 8 adjacent to the stockroom and the assembly area. The staging room will be used for storage of parts which have been pulled from stock but are waiting to go to the assembly area. The audit counting and logging procedure currently used will be eliminated. The staging room will be controlled by the Production Coordinator. A drawing of the basic layout is presented in Figure 2-10.

Stockroom Location

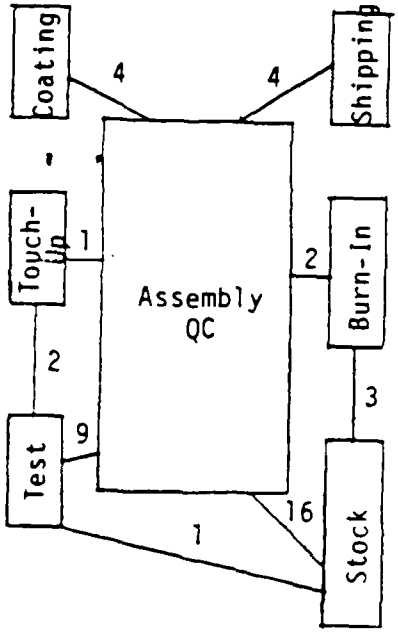
The stockroom will be located in Building 8 adjacent to the assembly area. This will reduce the time and distance used to transport kits from stock to the staging area. See Figure 2-11 for a layout of Building 8.

Stockroom Layout

The stockroom will be located in Building 8 adjacent to the assembly area. All parts will be located in bins

To \ From	Assembly	QC	Test	Touch-Up	Coating	Burn-In	Stock	Shipping
Assembly		17	5		3	2	16	
QC	41		3	4		1		
Test	4	7						
Touch-Up	1	1	2					
Coating	1	2						
Burn-in							3	
Stock		18	1					
Shipping		4						

IDEAL DEPARTMENTAL LAYOUT
BASED ON MATERIAL FLOW
THROUGH OPERATIONS



	To	From	Total
Assy	47	47	94
QC	49	49	98
Test	11	11	22
Touch-Up	4	4	8
Coating	3	3	6
Burn-In	3	3	6
Stock	19	19	38
Shipping	4	0	4
Total	140	136	276

To	FROM		
Assy QC	QC Assy	17 41	> 58
Assy Test	Test Assy	5 4	> 9
Assy Touch-Up	Touch-Up Assy	0 1	> 1
Assy Coating	Coating Assy	3 1	> 4
Assy Burn-In	Burn-in Assy	2 0	> 2
Assy Stock	Stock Assy	16 0	> 16

To	From		
Test Touch-Up	Touch-Up Test	0 2	> 2
Test Stock	Stock Test	0 1	> 1
Burn-In Stock	Stock Burn-In	3 0	> 3
Shipping	Assy	4	> 4
QC Stock	Stock QC	0 18	> 18
QC Test	Test QC	3 7	> 10

Figure 2-8. DEPARTMENTAL PROCESS LAYOUT

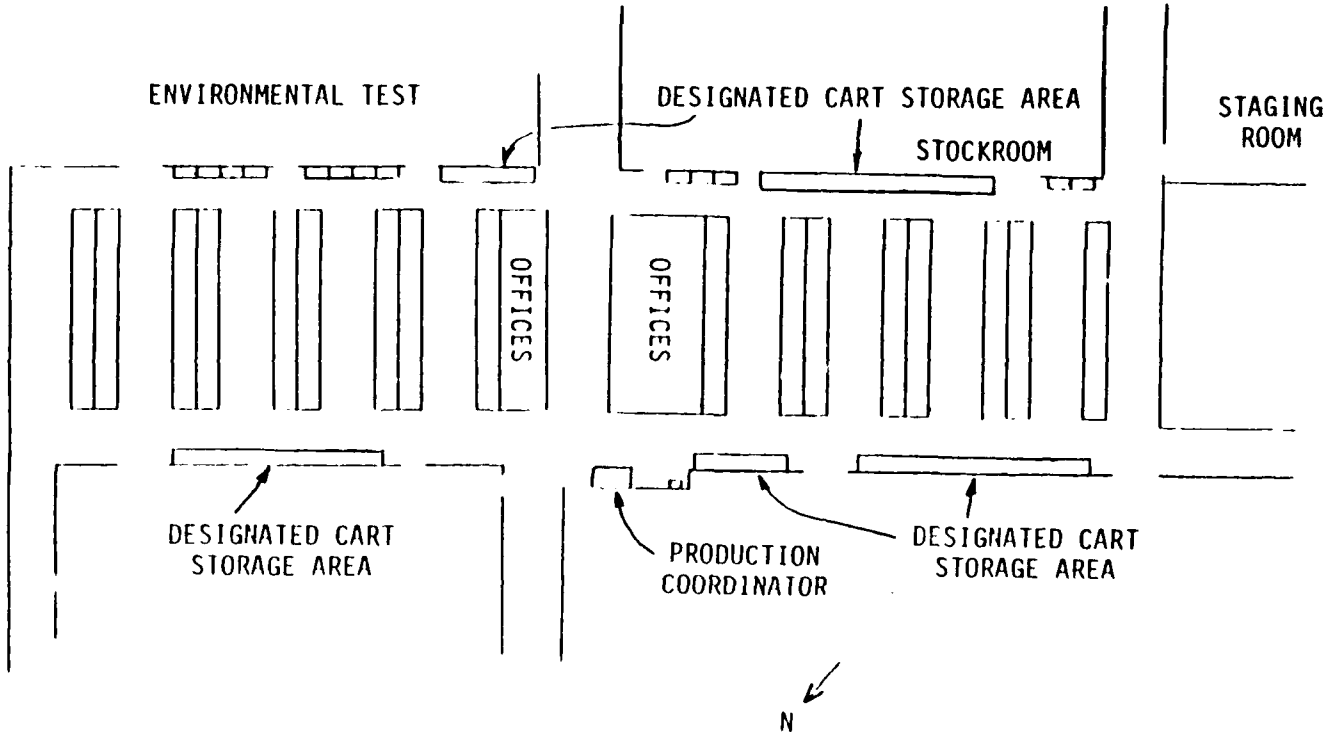


Figure 2-9. NEW ASSEMBLY LAYOUT

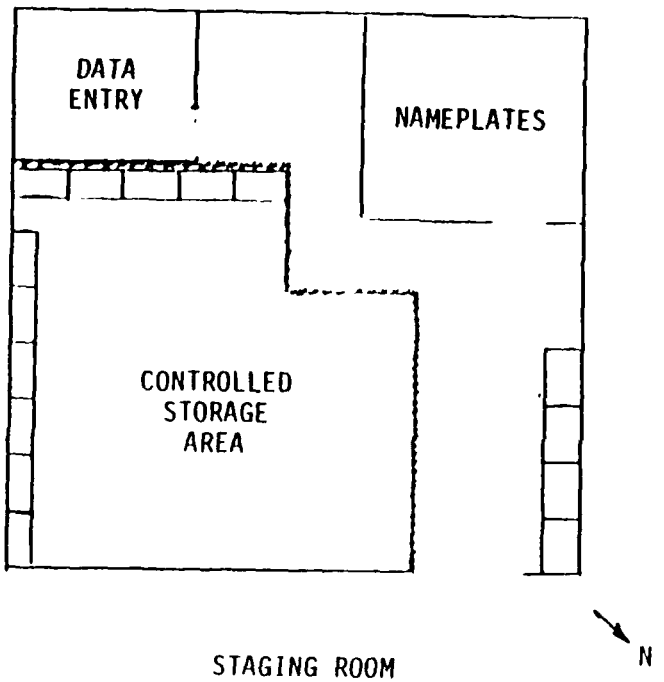
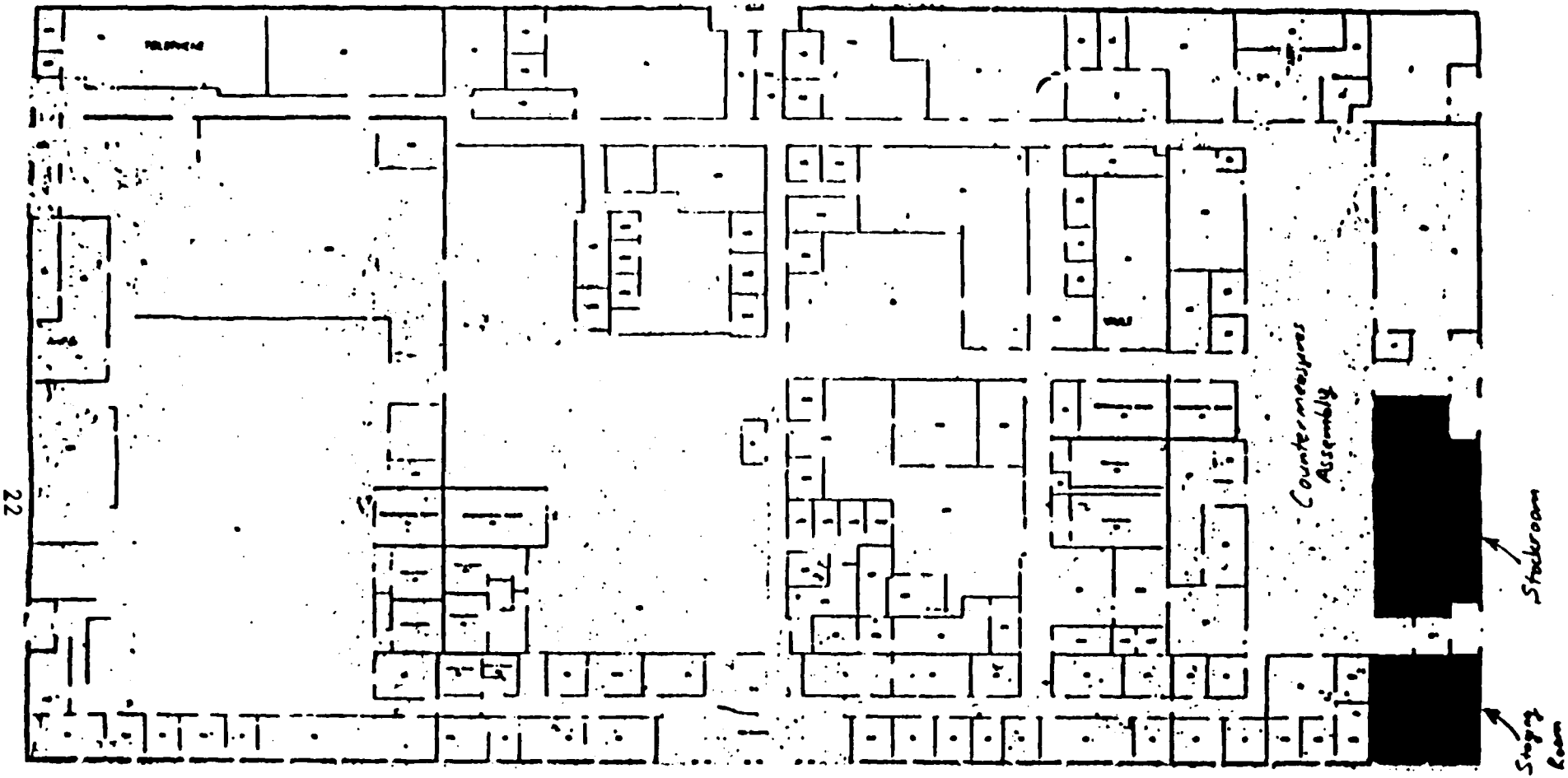


Figure 2-10. NEW STAGING ROOM LAYOUT



LOCATION PLAN FOR PROJECT

DARK AREA INDICATES CONSTRUCTION PROJECT AREA

Figure 2-11. NEW STOCKROOM/STAGING LOCATION

on the shelves in numerical sequence excluding bulk material. A layout is presented in Figure 2-12.

Preprinted Labels

Preprinted labels will be issued with the Quota Pull Request. The preprinted labels will be modified to include the workstation number and the location in which it should be set at the workstation. The modified labels will reduce the time used to set up a workstation. A modified preprinted label is presented in Figure 2-13.

Carts

Forty stockroom carts will be located in a designated cart storage area located next to the aisles of the assembly area. Each cart will have a place to hang storage containers and a work area in which to count parts. It will hold the Quota Pull Request and office equipment (pens, ruler, scissors, etc.). These carts will be pushed to the stockroom shelves, have the parts counted out on them, and then be pushed to the staging area. See Figure 2-14 for a picture of cart.

Fifteen additional carts will be used for large stock items which will not fit into the storage containers. These carts will be used to move material from stock to staging to assembly. See Figure 2-15 for cart description.

Ten carts for in process storage and moving parts to and from special areas (test, burn-in) will be provided in the assembly area. The carts will be located near each workstation. These carts will reduce time spent loading and unloading subasemblies by the Production Coordinator. See Figure 2-14 for a picture of cart.

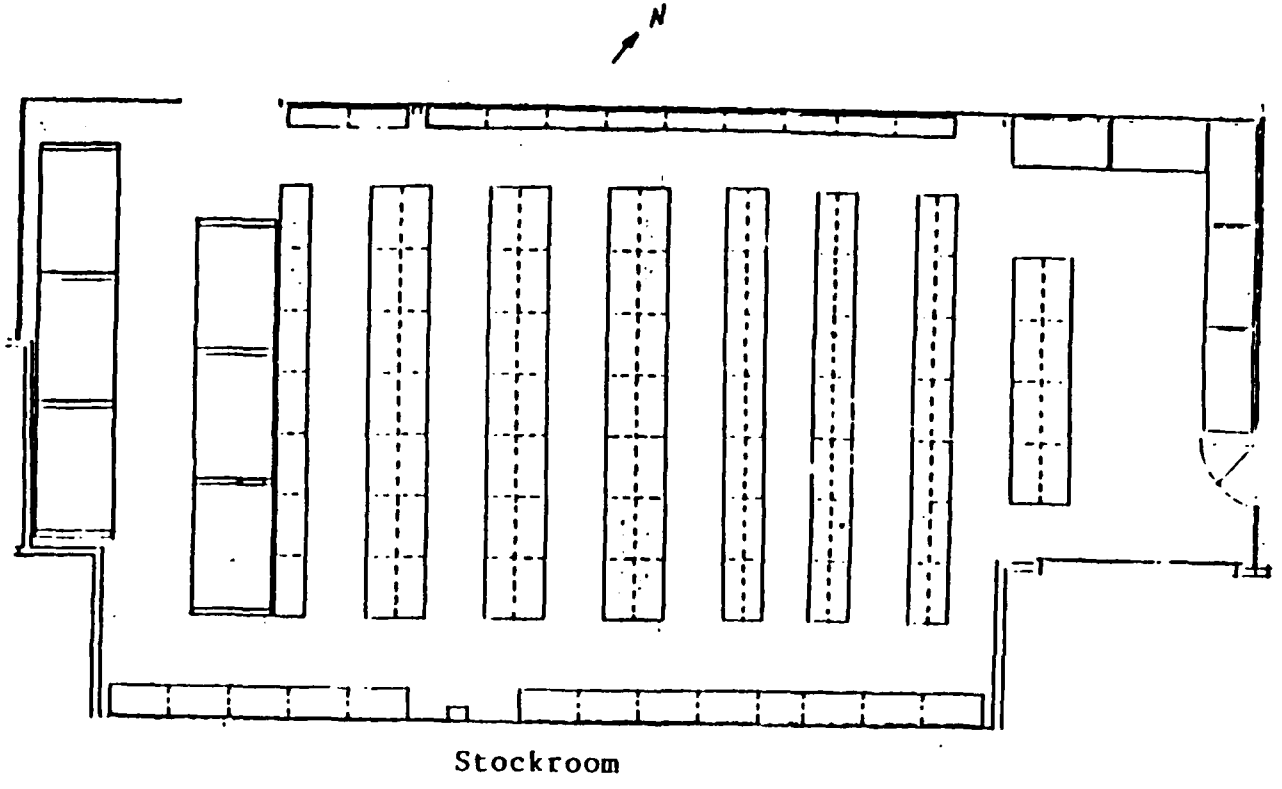


Figure 2-12. NEW STOCKROOM LAYOUT

PWO/NO JA1271 WS 1-1
P/N 24750-0413 SEQ 79
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 1-2
P/N 24750-0334 SEQ 65
QTY 450.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 1-3
P/N 24750-0303 SEQ 61
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 1-4
P/N 24750-0222 SEQ 99
QTY 300.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 2-1
P/N 24750-0681 SEQ 81
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 2-2
P/N 24750-0470 SEQ 101
QTY 50.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 2-3
P/N 24750-0333 SEQ 73
QTY 450.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 2-4
P/N 24750-0272 SEQ 83
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 2-5
P/N 24750-0183 SEQ 62
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 3-1
P/N 24750-0511 SEQ 56
QTY 300.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 3-2
P/N 24750-0335 SEQ 72
QTY 150.0 MRTO/NO H16140
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 3-3
P/N 24750-0332 SEQ 75
QTY 900.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 3-4
P/N 24750-0271 SEQ 80
QTY 150.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

PWO/NO JA1271 WS 3-5
P/N 24750-0152 SEQ 64
QTY 300.0 MRTO/NO H16139
ASY 004/141587-0005
TRACE DOC

Figure 2-13. MODIFIED PREPRINTED LABEL

STOCKROOM CART

IN-PROCESS CART

Figure 2-14. EXAMPLE - STOCKROOM CARTS

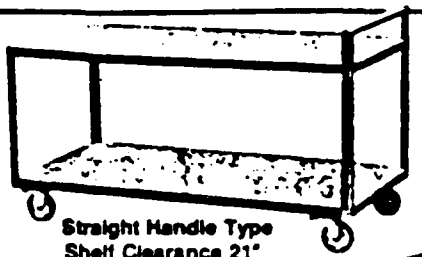
HODGE TRUCKS

All Welded ■ Shipped Completely Assembled ■ Ready to Use

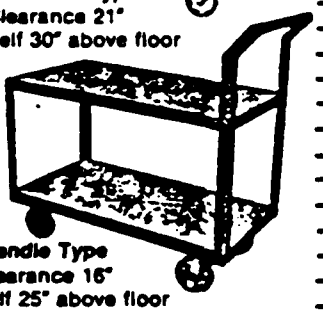
Low Deck Shop
800 lb. Capacity

- Shelves made of #13 gauge steel with lips down
- Handle offset on LD Series to allow room for fingers when loaded with packages
- Supplied with 5" rubber tired casters - 2 rigid and 2 swivel
- Finished in gray

For welded casters, add suffix -W
Example: LD-836-W
For shelves with lips up, add suffix -L
Example SH-830-L



Straight Handle Type
Shelf Clearance 21"
Top Shelf 30" above floor



Feature! Casters Mounted in Quick Change Caster Brackets

Offset Handle Type
Shelf Clearance 16"
Top Shelf 25" above floor

Depth	Width	Offset Handle Type	Straight Handle Type	Shp. Wt.
18"	30"	LD-830	SH-830	90
18"	33"	LD-833	SH-833	92
18"	36"	LD-831	SH-831	94
18"	48"	LD-832	SH-832	100
22"	36"	LD-836	SH-836	97
24"	30"	LD-834	SH-834	98
24"	36"	LD-835	SH-835	100
24"	42"	LD-837	SH-837	102
24"	48"	LD-838	SH-838	109
24"	54"	LD-839	SH-839	113
24"	60"	LD-840	SH-840	120
30"	42"	LD-841	SH-841	120
30"	48"	LD-842	SH-842	126
30"	60"	LD-843	SH-843	140
30"	72"	LD-844	SH-844	158
36"	60"	LD-845	SH-845	158
36"	72"	LD-846	SH-846	170

Portable Tables

Figure 2-15. CART DESCRIPTION

Stockroom Procedure

Upon receipt of a Quota Pull Request and the preprinted labels, the stockroom personnel will get a cart and enough storage bins to fill the order. The person will proceed to the first part number and location listed on the Quota Pull Request. Upon reaching the location, the person pulls the part bin from the shelf and counts out the proper number of parts on the cart. The person puts the part bin back onto the shelf. The person then gets a storage container from the cart, puts the counted parts into the storage container, and finds a preprinted label which corresponds to the part and puts it onto the storage container. The storage container with parts is put onto the cart. The person marks off the part on the Quota Pull Request and moves to the next part and location. When the person finishes all of the parts on the Quota Pull Request, the person pushes the cart with parts to the staging area and notifies the Production Coordinator. The person sends the Shortage Sheet to the planners and returns to the stockroom. This procedure eliminates writing the parts down, trips to the shelves and back to the desk to get parts, sealing the parts in a plastic bag, and trips to shelves to return the part bins. A Flow Process Chart is presented in Figure 2-16.

Setup Sheets

Setup Sheets will be prepared by the Manufacturing Engineers based on the Manufacturing Packages for each assembly. The Setup Sheets will standardize the workstations with operations, parts, and tools. Copies of all Setup Sheets will be included with the Instruction Sheets. The Setup Sheets will reduce time setting up the assembly workstation by providing part locations and a list of required tools.

FLOW PROCESS CHART

ANALYSIS — WHAT — WHO — WHERE — WHEN — HOW — QUESTION EACH DETAIL

NO _____

PAGE 1 OF 4

SUMMARY	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS	57					
⇨ TRANSPORTATIONS	28					
□ INSPECTIONS						
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

JOB Kitting Parts in Stockroom (6 Parts)

☒ MAN OR ☐ MATERIAL _____

CHART BEGINS _____

CHART ENDS _____

CHARTED BY GD DATE 2/8/85

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ACTION: ELIMINATE	COMBINE	CHANGE: SEQUENCE	CHANGE: PLACE	CHANGE: PERSON	SIMPLIFY	NOTES
1	Receive Quota Pull Sheet	●	⇨	□	D	▽										
2	Get cart from cart storage area	○	→	□	D	▽										
3	Put required number of bins on cart	●	⇨	□	D	▽										
4	Walk to shelf pushing cart w/ bins	○	→	□	D	▽										
5	Pull 1st part bin from shelf	●	⇨	□	D	▽										
6	Set bin on cart	○	→	□	D	▽										
7	Pick up part package	○	→	□	D	▽										
8	Open package	●	⇨	□	D	▽										
9	Count required number of parts	●	⇨	□	D	▽										
10	Reseal package	●	⇨	□	D	▽										
11	Put package back in bin from shelf	○	→	□	D	▽										
12	Put counted parts in bin from cart	●	⇨	□	D	▽										
13	Mark paperwork	●	⇨	□	D	▽										
14	Peel preprinted tag from sheet	●	⇨	□	D	▽										
15	Put preprinted tag on bin from cart	●	⇨	□	D	▽										
16	Put shelf bin back on shelf	●	⇨	□	D	▽										
17	Walk to shelf pushing cart	○	→	□	D	▽										
18	Pull 2nd part from shelf	●	⇨	□	D	▽										
19	Set bin on cart	○	→	□	D	▽										
20	Pick up part package	○	→	□	D	▽										
21	Open package	●	⇨	□	D	▽										
22	Count required number of parts	●	⇨	□	D	▽										
23	Reseal package	●	⇨	□	D	▽										
24	Put package back in bin from shelf	○	→	□	D	▽										

Figure 2-16. KITTING PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____
PAGE 2 OF 4

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	POSSIBILITIES: ELIMINATE	COMBINE	SIMPLIFY	CHANGE: PLACE	PERSON	SEQUENCE	NOTES
Put counted parts in bin from cart	●	⇨	□	D	▽										
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on bin from cart	●	⇨	□	D	▽										
Return shelf bin back to shelf	●	⇨	□	D	▽										
Walk to shelf pushing cart	○	➡	□	D	▽										
Pull 3rd part from shelf	●	⇨	□	D	▽										
Set bin on cart	○	➡	□	D	▽										
Pickup part package	○	➡	□	D	▽										
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin from shelf	○	➡	□	D	▽										
Put counted parts in bin from cart	●	⇨	□	D	▽										
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on cart bin	●	⇨	□	D	▽										
Return shelf bin to shelf	●	⇨	□	D	▽										
Walk to shelf pushing cart	○	➡	□	D	▽										
Pull 4th part from shelf	●	⇨	□	D	▽										
Set bin on cart	○	➡	□	D	▽										
Pickup part package	○	➡	□	D	▽										
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin from shelf	○	➡	□	D	▽										
Put counted parts in bin from cart	●	⇨	□	D	▽										
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										

Figure 2-16. KITTING - PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____ PAGE 3 OF 4

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	POSSIBILITIES: ELIMINATE	COMBINE	SIMPLIFY	CHANGE: PLACE	PERSON	SEQUENCE	NOTES
Put preprinted tag on cart bin	●	⇨	□	D	▽										
Return shelf bin to shelf	●	⇨	□	D	▽										
Walk to shelf pusing cart	○	◆	□	D	▽										
Pull 5th part from shelf	●	⇨	□	D	▽										
Set bin on cart	○	◆	□	D	▽										
Pickup part package	○	◆	□	D	▽										
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin from shelf	○	◆	□	D	▽										
Put counted parts in bin from cart	●	⇨	□	D	▽										
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on cart bin	●	⇨	□	D	▽										
Return shelf bin to shelf	●	⇨	□	D	▽										
Walk to shelf pushing cart	○	◆	□	D	▽										
Pull 6th part from shelf	●	⇨	□	D	▽										
Set bin on cart	○	◆	□	D	▽										
Pickup part package	○	◆	□	D	▽										
Open package	●	⇨	□	D	▽										
Count required number of parts	●	⇨	□	D	▽										
Reseal package	●	⇨	□	D	▽										
Put package back in bin from shelf	○	◆	□	D	▽										
Put counted parts in bin from cart	●	⇨	□	D	▽										
Mark paperwork	●	⇨	□	D	▽										
Peel preprinted tag from sheet	●	⇨	□	D	▽										
Put preprinted tag on cart bin	●	⇨	□	D	▽										
Return shelf bin to shelf	●	⇨	□	D	▽										
Walk to planner desk pushing cart	○	◆	□	D	▽										

Figure 2-16. KITTING PARTS IN STOCKROOM

FLOW PROCESS CHART

NO. _____
PAGE 4 OF 4

POSSIBILITIES

DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ELIMINATE	COMBINE	SEQUENCE	CHANGE PLACE	CHANGE PERSON	IMPROVE	NOTES
Leave cart with planner aide	●	⇨	□	D	▽										
Put shortage sheet in planner's box	○	◆	□	D	▽										
Return to stockroom	○	◆	□	D	▽										
	○	⇨

Workstation Description

A workstation will not be a permanent location but will be a standardization of the operations, required parts, and tools required in an area. The workstation location for an assembly will be designated by the assembly supervisor based on production requirements at the time of assembly. The work tables used for workstations will have racks permanently mounted to hang the part bins. Storage carts for finished assemblies will also be located next to a workstation. A standardized workstation will reduce setup time and reduce assembly time because the assembly operator will know the location of each part.

Production Coordinator

Upon receipt of a Production Work Order the Production Coordinator will retrieve the cart(s) with the kit and take the kit to the assembly area. After the working supervisor has audited the kit and placed the parts at the proper workstation, the Production Coordinator will return the cart to stock. A Flow Process Chart is presented in Figure 2-17.

The Production Coordinator will also move in-process subassemblies to the staging room or to a special area as required using the storage carts.

Working Supervisor

The Working Supervisor will get a Setup Sheet and the Quota Pull Request. The supervisor will verify the parts and quantities and set the parts at the proper workstation per the Setup Sheet and the preprinted label. The supervisor will also

set the required tools at the workstation. A Flow Process Chart is presented in Figure 2-18.

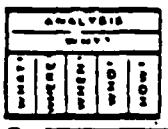
Testing Equipment

Cablescan Continuity Monitor/Tester units will be installed in the assembly areas. These units will reduce assembly and rework time while increasing assembly efficiency. A description of the Continuity Monitor/Tester is presented in Figure 2-19.

2.2 Project Management Plan

The Project Investigator for this project is George Dickinson, Industrial Engineer. The Project Investigator reports directly to the Industrial Tech Mod Program Manager, who is Russ Petrie. Responsibilities of the Project Investigator include project management, cost, schedule, and technical conformance.

The departments contributing direct support to the project include Manufacturing, Engineering, Material Control, and Quality Engineering. Considerable overhead support was contributed by Facilities Engineering. The organization for this project is depicted in Figure 2-20. The required job type and man-hours for this project appear in Chapter 3. The Project Master Schedule for this project is shown in Figure 2-21.



QUESTION EACH DETAIL

FLOW PROCESS CHART

NO _____
PAGE 1 OF 1

JOB Production Coordinator

[X] MAN OR [ ] MATERIAL

CHART BEGINS _____

CHART ENDS _____

CHARTED BY GD DATE 2/8/85

SUMMARY

	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS						
⇨ TRANSPORTATIONS						
□ INSPECTIONS						
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ACTION: ELIMINATE	ACTION: COMBINE	ACTION: CHANGE: SEQUE	ACTION: CHANGE: PLACE	ACTION: CHANGE: PERSON	ACTION: IMPROVE	NOTES
1	Receive PWO	●	⇨	□	D	▽										
2	Get cart with parts	●	⇨	□	D	▽										
3	Transport kit to work area	○	⇨	□	D	▽										
4	Return cart to storage area	○	⇨	□	D	▽										
5	after supervisor has verified parts	○	⇨	□	D	▽										
6		○	⇨	□	D	▽										
7		○	⇨	□	D	▽										
8		○	⇨	□	D	▽										
9		○	⇨	□	D	▽										
10		○	⇨	□	D	▽										
11		○	⇨	□	D	▽										
12		○	⇨	□	D	▽										
13		○	⇨	□	D	▽										
14		○	⇨	□	D	▽										
15		○	⇨	□	D	▽										
16		○	⇨	□	D	▽										
17		○	⇨	□	D	▽										
18		○	⇨	□	D	▽										
19		○	⇨	□	D	▽										
20		○	⇨	□	D	▽										
21		○	⇨	□	D	▽										
22		○	⇨	□	D	▽										
23		○	⇨	□	D	▽										
24		○	⇨	□	D	▽										

Figure 9.17 PRODUCTION COORDINATOR

FLOW PROCESS CHART

ANALYSIS — WHY? — WHAT? WHERE? WHEN? WHO? HOW?
QUESTION EACH DETAIL

NO. _____
PAGE 1 OF 1

JOB Working Supervisor

☐ MAN OR ☐ MATERIAL _____

CHART BEGINS _____

CHART ENDS _____

CHARTED BY GD DATE 2/8/85

SUMMARY

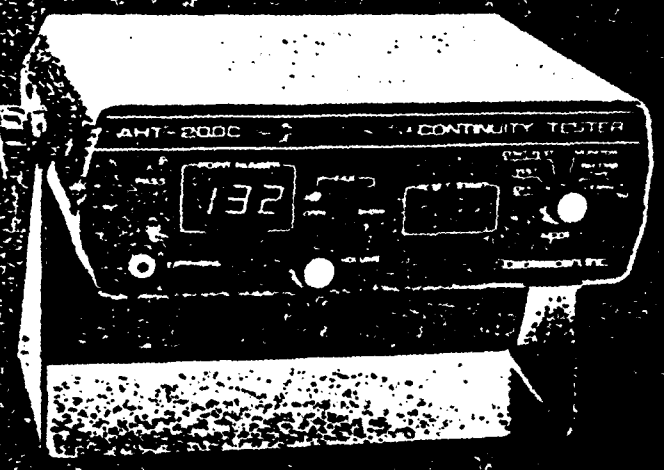
	PRESENT NO	PRESENT TIME	PROPOSED NO	PROPOSED TIME	DIFFERENCE NO	DIFFERENCE TIME
○ OPERATIONS						
⇨ TRANSPORTATIONS						
■ INSPECTIONS						
D DELAYS						
▽ STORAGES						
DISTANCE TRAVELED		FT.		FT.		FT.

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ACTION: ELIMINATE	COMBINE	CHANGE: SEQUENCE	CHANGE: PLACE	CHANGE: PERSON	IMPROVE	NOTES
1	Get Setup Sheet & Quota Pull	○	➡	☐	D	▽										
2	Verify parts and quantities	○	⇨	■	D	▽										
3	Set parts at proper workstation	●	⇨	☐	D	▽										
4	Set required tools at workstation	●	⇨	☐	D	▽										
5	Notify Production Coordinator	●	⇨	☐	D	▽										
6	that cart is ready to go to storage	○	⇨	☐	D	▽										
7		○	⇨	☐	D	▽										
8		○	⇨	☐	D	▽										
9		○	⇨	☐	D	▽										
10		○	⇨	☐	D	▽										
11		○	⇨	☐	D	▽										
12		○	⇨	☐	D	▽										
13		○	⇨	☐	D	▽										
14		○	⇨	☐	D	▽										
15		○	⇨	☐	D	▽										
16		○	⇨	☐	D	▽										
17		○	⇨	☐	D	▽										
18		○	⇨	☐	D	▽										
19		○	⇨	☐	D	▽										
20		○	⇨	☐	D	▽										
21		○	⇨	☐	D	▽										
22		○	⇨	☐	D	▽										
23		○	⇨	☐	D	▽										
24		○	⇨	☐	D	▽										

Figure 2-18. WORKING SUPERVISOR

Cablescan

AHT-200C AHT-200CP Self-Programming Continuity Monitor/Tester



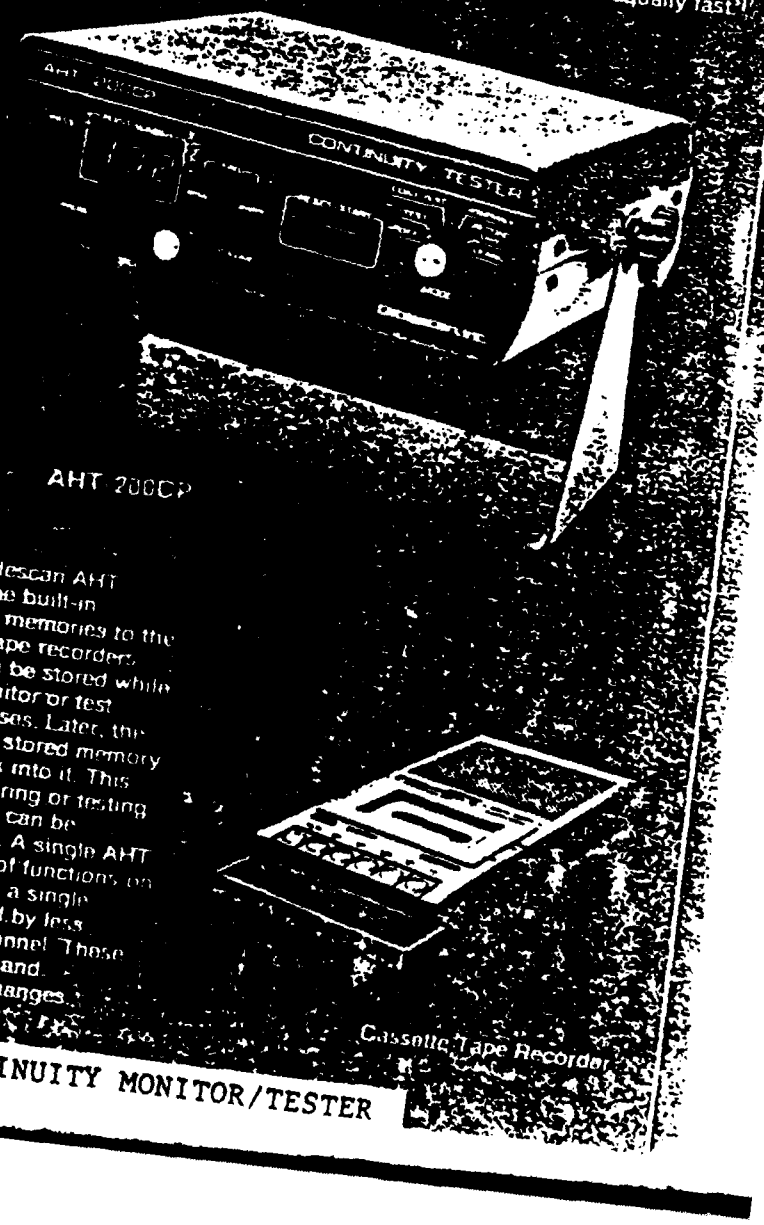
AHT-200C

The AHT Continuity Monitor/Tester, incorporating space-age microprocessor technology, represents a new era in cable and harness assembly efficiency. Dramatic savings in assembly and testing costs are provided by eliminating the need for preprogramming or wiring of programmed interfaces.

With the AHT you can monitor and test assemblies within minutes after you fabricate a correct cable or even a simulation, plus changeover from one cable program to another is equally fast!

The AHT incorporates sophisticated circuitry enabling it to "memorize" point-to-point and multiple circuit connections of an existing cable or harness in seconds. This memory is then retained in the unit as you monitor and test any number of additional assemblies.

The AHT-200CP has the same features except the Assembly mode replaces the Monitor mode. In this mode a probe located on the front panel is used to locate wires and provide "From" - "To" point data.



AHT 200CP

Special Features

Key Switch prevents accidental alteration of AHT's memory by unauthorized personnel.

Self-Test capability verifies the proper operation of the AHT before use, tests more than 90% of the unit's electronics with a flip of the mode switch.

Memory Error is indicated if the data input from a tape is unreadable.

Jack allows use of the earphone instead of the built-in speaker for assembly monitoring; volume control adjusts sound level for both.

Battery Pack incorporated internally with automatic charger to maintain and existing memory up to 30 days without external power in case of accidental power disconnects.

Stored Memory - Cablescan AHT models have the unique built-in capability to feed their memories to the cassettes of ordinary tape recorders. The programs can then be stored while the AHT is used to monitor or test differently wired harnesses. Later, the AHT can relearn from a stored memory by playing the tape back into it. This changeover from monitoring or testing one assembly to another can be accomplished in minutes. A single AHT can perform a multitude of functions on different harnesses within a single workday, all performed by less costly non-technical personnel. These same features allow quick and economical engineering changes.

Cassette Tape Recorder

Figure 2-19. CABLESCAN CONTINUITY MONITOR/TESTER

AHT-200C AHT-200CP

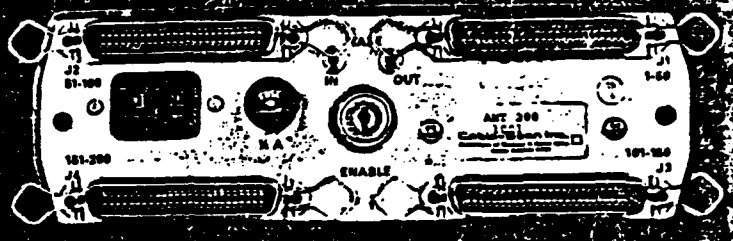
Learn • To input memory, connect a properly wired assembly or simulation to the unit, set the mode switch to Learn and press the start button. In less than a second, the pass light will come on, indicating that the AHT is programmed and ready to monitor or test.

Test • Interconnect a completed harness to the AHT and set the mode switch to Test. The unit immediately checks point-by-point and multiple connections against its memory and signals with the Pass light if the wiring is correct. A missing or poorly connected wire will be indicated by the Open light and the flashing of two point numbers. An incorrect connection is indicated by the Short light and display of the two point numbers which are connected. Additional errors will be detected by pressing Start or correcting an open condition.

Continuous Test • Intermittent shorts or open connections due to vibration, temperature extremes, etc., are readily detected by selecting the Continuous Test mode while subjecting the assembly to the suspected condition. The AHT will repeatedly test all connections until an error is detected, then it will display the type of problem and the point numbers.

Monitor • The AHT-200C will assist in wiring of assemblies by using the Monitor mode. Any attempt to miswire while assembling the harness is signalled by both an audio and visual display indicating a short. The two point numbers of the miswire will be displayed.

Assembly • The Assembly mode of the AHT-200CP has replaced the Monitor mode of the AHT-200C. A probe, located on the front panel, is used to locate wires and provide "From" - "To" point data. When a wire end is probed the display will indicate the point number along with the termination point number. An audio tone will sound when the wire is terminated properly and the display will be cleared. If the displayed wire is not to be terminated the wire may be cancelled by either depressing the Start switch or by probing the termination point. If the probed point has already been terminated the tone will sound to verify termination. After the assembly has been completed the Test mode is used to verify that all terminations have been completed and that no shorts have been created.



Back of unit

SPECIFICATIONS

Capacity	AHT-200 - 200 Points
Operating Speed	Test, Self Test, Monitor, Learn (from known good) less than 1s. Record Tape, Learn (from tape) less than 40s.
Sensitivity	Short Circuit: Less than 1K indicates short. Open circuit: More than 10K indicates open. Test Voltage: Less than 5VDC. Test Current: Less than 2mA.
Interwire Capacitance	1000 pF maximum
Display	.43 inch (11mm) LED numeric display. LED indicators for Pass, Open, Short.
Audio	Tone sounds when a short is created while in Monitor mode or on valid continuity in Assembly mode.
Program Memory	Unit has internal battery pack and automatic charger to provide program memory up to 30 days without external power.
Tape In	Impedance: 5KΩ Nominal Level: 2V P—P minimum
Tape Out	Impedance: 33Ω Nominal Level: 30mV P—P Nominal
Recorder Speed	Variation up to ±5% from record to playback is acceptable.
Power	104-126 VRMS or 208-252 VRMS internally selectable, 50-60 Hz
Operating Temperature	32°F to 105°F (0°C to 40°C)
Storage Temperature	-40°F to 165°F (-40°C to 74°C)
Maximum Dimensions	10.7 x 3.6 x 8.3 inches (27.18 x 21.08 x 9.14 cm) Dimensions do not include handle.
Weight	200 points: 6.39 lbs. (2.90 kg)

Ordering Information

Model Number	Description	Part Number
AHT-200C	200 Point Self-Programming Continuity Monitor/Tester	5210695-01
AHT-200CP	200 Point Self-Programming Continuity Tester & Assembly Aid	5210816-01

Accessories

Cassette Tape Recorder	5210660
Probe	5210465

NOTE: Operating characteristics are designed to be compatible with any good quality consumer tape recorder. Specification change privileges reserved.

Cablescan, Inc.
A Subsidiary of Eubanks Engineering Co.
2145 E. Emerson Avenue, Orange, California 92665
(714) 998-1861 • Telex 692345

The Mello Company, Inc.
P.O. BOX 29301 • Dallas, Texas 75229
214/241-9196

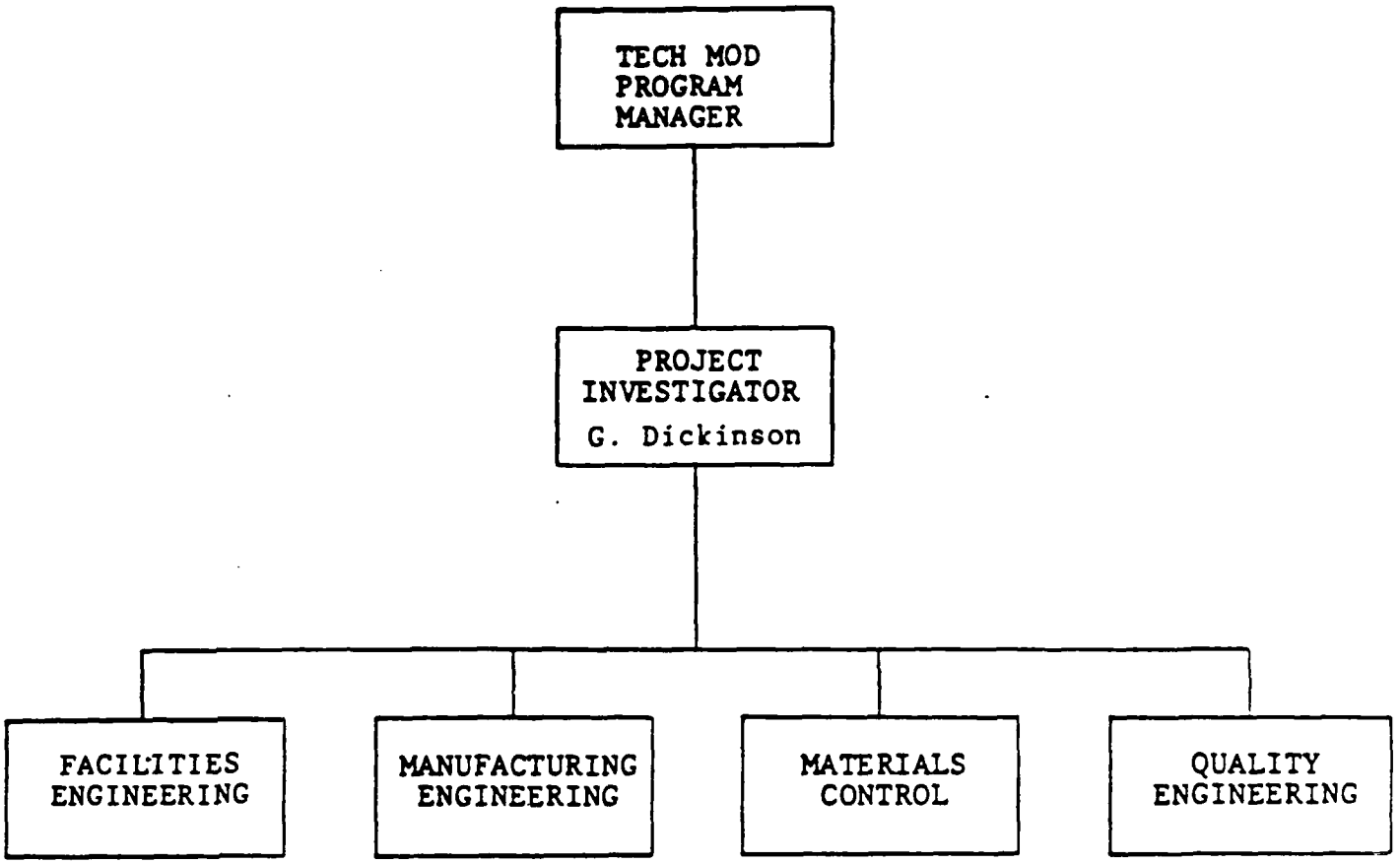


Figure 2-20.

PROJECT ORGANIZATION STRUCTURE
COUNTERMEASURES ASSEMBLY

Tracor Aerospace

APPROVED BY: R. PETRIE

PREPARED BY: G. DICKINSON

PROGRAM NO. COUNTERMEASURES ASSEMBLY

ORIG. DATE JAN. 15, 1985

REV. DATE FEB. 28, 1985

ITEM	DESCRIPTION
1	DEFINE REQUIREMENTS
2	
3	PREPARE EQUIPMENT SPECIFICATIONS
4	
5	DESIGN STOCKROOM LAYOUT
6	
7	PREPARE IMPLEMENTATION PLAN
8	
9	COST BENEFIT ANALYSIS
10	
11	FINAL MANAGEMENT REVIEW
12	
13	SUBMIT TO GENERAL DYNAMICS
14	
15	PROCURE EQUIPMENT
16	
17	INSTALL STOCKROOM
18	
19	PREPARE ASSY IMPROVEMENTS
20	
21	TRAIN PERSONNEL & IMPLEMENT
22	
23	PROJECT INVESTIGATOR FOLLOW-UP
24	
25	
26	
27	
28	
29	
30	

1985

JAN. | FEB. | MAR. | APR. | MAY | JUN. | JUL. | AUG. | SEPT.

△ SCHEDULED

▲ COMPLETED ON SCHEDULE

△ - - - △ SCHEDULE COMPLETION EXPECTED TO SLIP

▲ △ COMPLETED AHEAD OF SCHEDULE

△ ▲ COMPLETED BEHIND SCHEDULE

▲ △ PROGRESS (IN % COMPLETION)

NOTES

Figure 2-21. PROJECT MASTER SCHEDULE

3.0 IMPACT OF PROJECT SAVINGS ON FUTURE PROPOSALS

Beginning 1 June 85 all proposals leaving Tracor will have to include a slight price reduction as a result of the Tech Mod project for the Countermeasures Assembly Improvements. These improvements will be put in place during the summer, and the shop will start using the Cablescan Continuity Monitor/Tester (CCM/T) on 1 Sep 85. However, the parts coming through the improved shop will not show up in LRU's to be shipped until Feb 1986. This is due to the normal scheduling of parts through the sequence of Fab-Finish-PCB-Assembly-Test-Ship.

For the purpose of proposals, Tracor intends to eliminate any possibility of submitting old labor estimates on parts to be produced using the CCM/T. This section explains the procedures to be used in properly pricing proposals that contain Countermeasures Shop parts.

During the first 5 months of operation, using the CCM/T, the 13 part numbers that currently go through the Countermeasures Assembly will be processed through the shop <u>once</u>. This is based on the average length of time between PWO runs on a variety of part numbers from past records. It will take a <u>second</u> 5-month period (Feb - Jun 86) for 2 lots of all part numbers to get through the shop, another 5 months for 3 lots, etc. It is assumed that it will take five 5-month periods, or 25 months (1 Sep 85 - 30 Sep 87), before the 13 part numbers will have been through the Cuontermeasures Assembly 5 times, for 5 "new" actuals.

Normally, Tracor bases its proposals on the average labor and materials cost on the last 5 runs of each part number that goes into an LRU. Tracor will continue to roll-up manufacturing bids based on the last 5 actuals, but will make an

adjustment at the LRU level to take into account the savings being realized for Countermeasures LRU's. The adjustment will depend upon when the data on the last 5 runs is gathered.

The following explains how the adjustment will be made during the September 1985 - September 1987 time frame:

1 June 85 - 31 Aug 85

During this period all 5 manufacturing lots are "old" touch labor actuals, recorded in the "unimproved" Countermeasures LRU's. For a proposal being prepared during this period with contractual delivery in February 1986 or later, each LRU will have to be adjusted downward by an amount equal to the proposed Countermeasures Shop savings. The savings have been identified by LRU and are being provided to our Proposals people concurrently with the submittal of this proposal.

1 Sep 85 - 31 Jan 86

The proposals prepared during this period will be based on 4 "old" lots and 1 "new" lot. We cannot deduct the full savings from manufacturing estimates on each LRU because the figures already reflect some improvement based on the 1 new lot. Therefore, 80% of the full LRU savings will be deducted from the manufacturing estimates during this time period.

1 Feb 86 - 30 Jun 86

Since the manufacturing actuals will now show 3 "old" lots and 2 "new" lots, 60% of the LRU savings will be deducted from manufacturing estimates for each LRU during this period.

1 Jul 86 - 30 Nov 87

The manufacturing actuals during this period will now contain 2 "old" lots and 3 "new" lots. Forty percent of the LRU savings will be deducted from each LRU during this period.

1 Dec 87 - 30 Apr 87

Actuals now contain just 1 "old" lot and 4 "new" lots. Deduct 20% of full LRU savings during this period.

1 May 87 and after

After 1 May 1987 all 5 manufacturing lots are assumed to be "new" actuals, recorded in the "improved" Countermeasures Assembly LRU's. Since the data fully reflects the full savings, there is no longer any adjustment required at the LRU level.

As accounting date is generated on actual hours per part following implementation of the improvements, savings data will be compared to expectations. Depending on whether savings are higher or lower than expected, there may have to be some revisions made to the systematic procedures and percentage adjustments outlined above.

VOLUME I

ATTACHMENTS

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
Phase III Proposal
Attachment A - Project Economic Summary

Implementation Date:		1 Sept 1985
Man-Hour Savings	Instant F16	253.8
	Future F16	1607.9
	Instant Other DoD	598.8
	Future Other DoD	3303.9
	TOTAL	5764.4
Labor and Material Savings (Loaded $'s thru fees)	Instant F16	$ 7,585
	Future F16	$ 51,414
	Instant Other DoD	$ 17,595
	Future Other DoD	$ 107,821
	TOTAL	$ 184,415
Internal Rate of Return:		21.7%
Payback in Years:		2.5
Subcontractors Capital Funds:		$ 38,220
Subcontractors Related Funds:		$ 15,830
DoD Funds:		$

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

Phase III Proposal

Attachment B - Project Cash Flow Summary

See IRR model results in Volume II 2.0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

Phase III Proposal

Attachment C - Expenditure Summary

Capital Labor	1985
Install Stockroom	
Contract Labor (Exp. Code 25)	
300 hours x $10 per hour (est.)	$ 3,000
Prepare Setup Sheets (PWO's)	
Manufacturing Engineer, Bid Code M2, Exp. Code 05	
250 hours x $14.90 ① x 2.60 ②	9,685
Modify Computer Printouts	
Operation Services (Exp. Code 01)	
300 hours x $10 per hour (est.)	3,000
Train Personnel	
Manufacturing Engineer, M2, 05.	
250 hours x $14.90 x 2.60	9,685
	$25,370

① Hourly bid rate per latest revised bid package (thru 4-5-85)

② 1 + overhead rate from latest revised bid package (thru 4-5-85)

COUNTERMEASURES ASSESMBLY IMPROVEMENTS PROJECT

Phase III Proposal

Attachment C - Expenditure Summary (cont.)

			1985
Capital Equipment			
2	Cablescan Monitor Testers	$1895.00 ea.	$ 3,790
8	Mating Connectors	30.00 ea.	240
1	Tape Recorder for programming Continuity Monitor Testers	161.00 ea.	161
40	Portable Stockroom Carts	125.00 ea.	5,000
10	Portable In-Process Carts	229.00 ea.	2,290
15	Low Deck Carts w/o Racks	110.00 ea.	1,650
1000	Storage Containers (small)	.65 ea.	650
200	Storage Containers (large)	1.43 ea.	286
80	3-Tier Table Storage Racks	16.00 ea.	1,280
	Staging Room Caging		894
			$16,241
	Tax 5 1/8%		832
			$17,073
	Material Handling 12%		2,049
	Total		$19,122
Capital Other			
	Construct Stockroom & Staging Area FIR 85-003		$ 3,283
TOTAL CAPITAL (Recovered)			$47,775

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

Phase III Proposal

ATTACHMENT C - Expenditure Summary (cont.)

Non-Recovered Expensed Costs	1985
Project Investigator Mfg. Engineer, M2, 05 300 hours x $14.90 x 1.32	$ 5,900
Move stock, label shelves, enter locations Stockroom Personnel, M7, 05 500 hours x $5.87 x 1.32	3,874
Removal & rework of old structures in new Stockroom area FIR 85-003	8,033
Total Non-Recovered Expensed Costs	$17,807

Recovered Expensed Costs (Budgeted)	
Design & Layout of Stockroom & Staging Room Facility Engineer, 01 150 hours x $10.00 (est.) x 1.32	$ 1,980
Total Recovered Expense Costs	$ 1,980

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
Phase III Proposal
Attachment D - Project Assumptions

No specific assumptions were made during the course of this project investigation.

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
Phase III Proposal
Attachment E - Visual Summary of Current
and Proposed Processes

See Sections 1 and 2, Volume I.

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
Phase III Proposal
Attachment F - IRR Computations

See IRR Model, Volume II, page 3.

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT G - MANUFACTURING SCHEDULES

	INSTANT						FOLLOW-ON					
	F16		USAF		COMM'L		F16		USAF		COMM'L	
	1985	1986	1985	1986	1985	1986	1986	1987-91	1986	1987-91	1986	1987-91
130386-0001	12		72		12						170	114
*133490-0001			43									
*133490-0002			136									44
133686-0001			245				96	213				44
133800-0001			117		6		96	213	35	76	7	22
133882-0001			36									22
133882-0002			36									22
133896-0001	72		133		8							44
*134001-0001	117		179									44
134016-0001			43						26	77		
134025-0001												44
*134025-0002	72		78									
*134036-0001			72									44
*135820-0003					2						61	35
*135820-0004					2							
135850-0110											170	70
135878-0001	82		327				96	213	45	45		
*135890-0002	107		409				192	426				
*135890-0003			23						90	90		
135912-0001	534		49				96	213	90	90		

* Cablescan savings related part number

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT G - MANUFACTURING SCHEDULES

	INSTANT						FOLLOW-ON					
	F16		USAF		COMM'L		F16		USAF		COMM'L	
	1985	1986	1985	1986	1985	1986	1986	1987-91	1986	1987-91	1986	1987-91
136550-0001			3									
136570-0001			1						26	67		
*136580-0001			1						26	67		
139651-0002			*131*									
140487-0001	176		300				96	213	45	45		
141020-0001			144						448	240		
141030-0001			36						112	60		
142927-0001					6							
142942-0001					24							
142949-0001					6							
142952-0001					6							
143119-0001					404						45	
143120-0001					292						45	
143121-0001					512							
148250-0001					55						45	
155200-0001					4						34	11
157600-0001	1				1							
143112-0001					24							
143115-0001					12							
135602-0004			1									

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT G - MANUFACTURING SCHEDULES

	INSTANT						FOLLOW-ON					
	F16		USAF		COMM'L		F16		USAF		COMM'L	
	1985	1986	1985	1986	1985	1986	1986	1987-91	1986	1987-91	1986	1987-91
135602-0400			3									
135603-0300			4									
135604-0500			3									
135947-0001							96	213	45	45	45	
136530-0001									26	67	51	24
*136540-0001									26	67		
136560-0001									26	67		
145303-0001											24	
145304-0001											24	
145550-0001											7	
145560-0001											7	
145570-0001											7	
148075-0001											45	
148125-0001											45	
148331-0001											90	
148451-0001											45	
154097-0001											7	
145180-0002											48	
145576-0001											7	

TECH MOD COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS

RELOCATE STOCKROOM
(eliminate costs - observation by IE to assess savings)
4 trips/day x 12 min/trip x 246 days/yr x hr/60 min =
196.8 hr/yr
8 trips from test/day x 12 min/trip x 246 day/yr x hr/60 min =
393.6 hr/yr
TOTAL = 196.8 + 393.6 = 590.4 hrs/yr

MODIFY STOCKROOM PROCEDURES (reduce costs)
Data from timing of 6 parts pulled 2/8/85
5000 parts/month pulled
5000 parts/month x 30% (# of parts pulled using cart) =
1500 parts/month

PULLING PARTS (See Kitting Parts in Stockroom - Figure 1-4)
0.15 min/step-6 parts x 7 steps x 1500 parts/month x hr/60 min
x 12 month/yr = 52.5 hr/yr

PACKAGING PARTS (see Fig. 1-4)
0.16 min/step-part x 2 steps x 1500 parts/month x hr/60 min
x 12 month/yr = 96 hrs/yr

RETURNING PARTS TO SHELF (see Fig. 1-4)
0.12 min/step-6 parts x 9 steps x 1500 parts/yr x 12 months/yr
x hr/60 min = 54 hrs/yr
TOTAL = 52.5 + 96 + 54 = 202.5 hrs/yr (overhead function)

ELIMINATE STAGING AREA (see Staging Parts/Verifying
Quantities - Figure 1-5)
0.12 + .16 + .42 + .5 + .16 + .12 = 1.48 min/kit
0.4 + .4 + .4 + .16 + .16 = 1.52 min/part
1.48 min/kit x 5 kit/day x 246 day/hr x hr/60 min = 30 hrs/yr
1.52 min/part x 5000 part/month x 12 month/yr x hr/60 min =
1520 hr/yr
TOTAL = 30 hr/yr + 1520 hr/yr = 1550 hrs/yr (overhead function)

PRODUCTION COORDINATOR-STAGING TO ASSEMBLY
(eliminate costs - Fig. 1-6)
1 min/kit x 5 kit/day x 246 day/yr x hr/60 min = 20.5 hr/yr
(S7)

TECH MOD COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS

SORTING PARTS AT WORKSTATION (reduce costs - see Fig. 1-7)
5 kit/day average taken from staging room logout sheet over 6-month period. Timed the sorting operation to get times.
0.42 min/kit x 5 kit/day x 246 day/yr = 8.6 hrs/yr
1.38 min/part x 1500 parts/month x 12 month/yr x hr/60 min = 414 hrs/yr
TOTAL = 8.6 hrs/yr + 414 hrs/yr = 422.6 hrs/hr (M7)

CONTINUITY MONITOR/TESTER
Savings based on standard times formula for manually sorting wires in a bundle (W x W x .005 = times in minutes) and the time required to label each wire (0.153 min/wire). The time to sort and install the wires to the proper connector location using the Continuity Monitor/Tester (0.2 min/wire) was subtracted from the manual time to compute the total savings. (See below.)
Example: 33 wires
33 x 33 x 0.005 = 5.445 min/assy
33 x 0.153 = 5.049 min/assy
5.445 + 5.049 = 10.494 min/assy (manually)
33 x 0.2 = 6.6 min/assy (Continuity Tester)
SAVINGS = 10.494 - 6.6 = 3.894 min/assy

LRU'S	SUBASSY'S	# OF WIRES	SAVINGS	BID CODE
135890-0002		30, 23	4.65 min/assy	(M7)
135890-0003		33	3.89 min/assy	(M7)
134001-0001	(134007-1)	34, 15	4.60 min/assy	(M7)
134025-000X	(134030-1)	16, 32	5.65 min/assy	(M7)
	(134030-2)	16, 32	5.65 min/assy	(M7)
	(134030-3)	16, 32	5.65 min/assy	(M7)
134036-0001		50	10.15 min/assy	(M7)
136540-0001		30, 31, 30	9.52 min/assy	(M7)
135820-0003	(135845-1)	44	7.61 min/assy	(M7)
135820-0004	(135845-1)	44	7.61 min/assy	(M7)
136580-0001	(136581-1)	40, 20	7.18 min/assy	(M7)
133490-0001		15	0.42 min/assy	(M7)
133490-0002		15	0.42 min/assy	(M7)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT N - SAVINGS CALCULATIONS

CABLESCAN (uses "*" marked part # from Attachment G)

Part Number	Minutes Saved	F16 '85 Units	F16 '85 Tot.Sav.	F16 '86 Units	F16 '86 Tot.Sav.	F16 '87 Units	F16 '87 Tot.Sav.	USAF '85 Units	USAF '85 Tot.Sav.	USAF '86 Units	USAF '86 Tot.Sav.	USAF '87 Units	USAF '87 Tot.Sav.	COMM'L '85 Units	COMM'L '85 Tot.Sav.	COMM'L '86 Units	COMM'L '86 Tot.Sav.	COMM'L '87 Units	COMM'L '87 Tot.Sav.
FIRM																			
133490-0001	.42							43	18.06										
2	.42							136	57.12										
134001-0001	4.6	117	538.2					179	823.4										
134025-0001	5.65																		
2	5.65	72	406.8					78	440.7	34	192.1								
3	5.65																		
134036-0001	10.15							72	730.8										
135820-0003	7.61													2	15.22				
4	7.61													2	15.22				
135890-0002	4.65							409	1901.85										
3	3.89							23	89.47										
136540-0001	9.52																		
136580-0001	7.18							1	7.18										
TOTAL Minutes			945.0		-0-		-0-		4068.58		192.1		-0-				-0-		-0-
Hours			15.8						67.8		3.2				.5				

= 87.3

'85 = 84.1

'86 = 3.2

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS

CABLESCAN (uses "a" marked part # from Attachment G)

		F16						USAF						COMM'L					
		'85		'86		'87		'85		'86		'87		'85		'86		'87	
Part Number	Minutes Saved	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.	Units	Tot.Sav.
PROPOSED																			
133490-0001	.42																		
2	.42																		
134001-0001	4.6																	44	18.48
134025-0001	5.65																	44	202.4
134036-0001	10.15																	44	248.2
135820-0003	7.61																	44	446.60
4	7.61															61	464.21	35	266.35
135890-0002	4.65			192	892.8	426	1980.9									61	464.21	35	266.35
3	3.89									90	350.1	90	350.1						
136540-0001	9.52									26	247.52	67	637.84						
136580-0001	7.18									26	186.68	67	481.06						
TOTAL Minutes		-0-		892.8			33.0	-0-		784.3		1469.0		-0-		928.42		1448.4	
Hours				14.9						13.1		24.8				15.5		24.1	

= 125.4

'86 = 43.5

'87 = 81.9

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS

	INSTANT SAVINGS		PROPOSED SAVINGS		
	1985	1986	1986	1987	1988-91
F16 Stockroom relocation	135.9 hrs		135.9 hrs	135.9 hrs	Same hours as '87 with rates *1.05 for PSI
① 23% S7	x $ 9.92		x $10.42	x $10.94	
	$1348		$1415	$1486	
Sort parts at workstation	97.3		97.3	97.3	
M7	x $ 5.92		x $ 6.22	x $ 6.53	
	$ 576		$ 605	$ 635	
Cablescan	15.8		14.9	33.0	
M7	x $ 5.92		x $ 6.22	x $ 6.53	
	$ 94		$ 93	$ 215	
Staging method change	4.8		4.8	4.8	
S7	x $ 9.92		x $10.42	x $10.94	
	$ 48		$ 50	$ 52	
TOTAL	$2066		$2163	$2388	
USAF Stockroom relocation	301.4 hrs		301.4 hrs	301.4 hrs	
① 51% S7	x $ 9.92		x $10.42	x $10.94	
	$2990		$3139	$3296	
Sort parts at workstation	215.7		215.7	215.7	
M7	x $ 5.92		x $ 6.22	x $ 6.53	
	$1277		$1341	$1408	
Cablescan	67.8	3.2	13.1	24.8	
M7	x $ 5.92	x $ 6.22	x $ 6.22	x $ 6.53	
	$ 401	$ 20	$ 81	$ 162	
Staging method change	10.7		10.7	10.7	
S7	x $ 9.92		x $10.42	x $10.94	
	$ 106		$ 111	$ 117	
TOTAL	$4774	$ 20	$4672	$4983	

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS

COMM'L				
① 26%	Stockroom relocation	153.7 hrs	153.7 hrs	153.7 hrs
	S7	x $ 9.92	x $10.42	x $10.94
		$1525	$1601	$1681
	Sort parts at workstation	110.0	110.0	110.0
	M7	x $ 5.92	x $ 6.22	x $ 6.53
		$ 651	$ 684	$ 718
	Cablescan	.5	15.5	24.1
	M7	x $ 5.92	x $ 6.22	x $ 6.53
		$ 3	$ 96	$ 157
	Staging method change	5.5	5.5	5.5
	S7	x $ 9.92	x $10.42	x $10.94
		$ 55	$ 57	$ 60
	TOTAL	$2234	$2438	$2616

① %'s based on total Countermeasures Assembly LRU's in 1985; Category (ex F16)/Total. See Attachment G. % used on all but Cablescan savings.

Cablescan savings uses asterisked parts shown on Attachment G and hours saved calculations on prior page.

VOLUME II

CONTRACT PRICING PROPOSAL COVER SHEET

1. SOLICITATION/CONTRACT/MODIFICATION NO.: P.O. #1005205 F

FORM APPROVED OMB NO. 3090-0116

NOTE: This form is used in contract actions if submission of cost or pricing data is required. *(See FAR 15.804-6(b))*

2. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*

Tracor Aerospace Austin, Inc.
6500 Tracor Lane
Austin, Texas 78725

3A. NAME AND TITLE OF OFFEROR'S POINT OF CONTACT: Ralph G. Leigh, Special Ass't to Div. V.P., Contracts

3B. TELEPHONE NO.: 512-929-2192

4. TYPE OF CONTRACT ACTION *(Check)*

	A. NEW CONTRACT		D. LETTER CONTRACT
X	B. CHANGE ORDER		E. UNPRICED ORDER
	C. PRICE REVISION/ REDETERMINATION		F. OTHER *(Specify)*

5. TYPE OF CONTRACT *(Check)*

[X] FFP [ ] CPFF [ ] CPIF [ ] CPAF
[ ] FPI [ ] OTHER *(Specify)*

6. PROPOSED COST *(A+B=C)*

A. COST	B. PROFIT/FEE	C. TOTAL
$ N/A	$ N/A	$ N/A

7. PLACE(S) AND PERIOD(S) OF PERFORMANCE

Austin, Texas

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. *(Continue on reverse, and then on plain paper, if necessary. Use same headings.)*

A. LINE ITEM NO.	B. IDENTIFICATION	C. QUANTITY	D. TOTAL PRICE	E. REF
03	Phase 3/Category 1 Countermeasures Assembly Improvements Project			
	Gross Savings		184,415	Vol. II
	DoD Share of Savings		159,235	Vol. II
	Subcontractor Productivity Savings Reward (w/ Option 3 Payments)		39,269	Vol. II

9. PROVIDE NAME, ADDRESS, AND TELEPHONE NUMBER FOR THE FOLLOWING *(If available)*

A. CONTRACT ADMINISTRATION OFFICE

DCAS Resident Office
Attn: Lloyd Billiter
6500 Tracor Lane
Austin, Texas 78725

B. AUDIT OFFICE

DCAA Regional Office
J. R. Walters, Chief
6500 Tracor Lane
Austin, Texas 78725

10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? *(If "Yes," identify)*

[ ] YES [X] NO

11A. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT? *(If "Yes," complete Item 11B)*

[ ] YES [X] NO

11B. TYPE OF FINANCING *(If one)*

[ ] ADVANCE PAYMENTS [ ] PROGRESS PAYMENTS
[ ] GUARANTEED LOANS

12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? *(If "Yes," identify item(s), customer(s) and contract number(s))*

[X] YES [ ] NO

Block Fabrication Improvements
Machine Shop Improvements

13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31 COST PRINCIPLES? *(If "No," explain)*

[X] YES [ ] NO

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA *(Public Law 91-379 as amended and FAR PART 30)*

A. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? *(If "No," explain in proposal)*

[X] YES [ ] NO

B. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT *(CASB DS-1 or 2)*? *(If "Yes," specify in proposal the office to which submitted and if determined to be adequate)*

[X] YES [ ] NO See Block A

C. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NONCOMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? *(If "Yes," explain in proposal)*

[X] YES [ ] NO

D. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? *(If "Yes," explain in proposal)*

[ ] YES [X] NO

This proposal is submitted in response to the RFP contract, modification, etc. in Item 1 and reflects our best estimates and/or actual costs as of this date

15. NAME AND TITLE *(Type)*

Ralph G. Leigh, Special Assistant to Division Vice President, Contracts

16. NAME OF FIRM

Tracor Aerospace Austin, Inc.

17. SIGNATURE

Ralph G. Leigh

18. DATE OF SUBMISSION

24 May 1985

☆ U.S. GOVERNMENT PRINTING OFFICE : 1984 O - 421-526 (27)

VOLUME II 2.0

INDUSTRIAL MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY7)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1985	1986	1987	1988
INVESTMENTS				
BUDGETED & RECOVERED CAPITAL				
COST OF CAPITALIZED LABOR	$ 25,370	$ 0	$ 0	$ 0
COST OF CAPITALIZED EQUIPMENT	$ 16,241	$ 0	$ 0	$ 0
COST OF CAPITALIZED OTHER	$ 3,123	$ 0	$ 0	$ 0
WITH SALES TAX & MTL OVERHEAD				
TOTAL CAPITAL (AFTER % DOD BUSINESS)	$ 38,220	$ 0	$ 0	$ 0
BUDGETED & RECOVERED EXPENSED				
AFTER APPLYING PER CENT DOD BUSINESS				
TOTAL RECOVERED EXPENSED COST	$ 1,584	$ 0	$ 0	$ 0
UNRECOVERED EXPENSE				
TOTAL NON RECOVERED EXPENSED COST	$ 14,246	$ 0	$ 0	$ 0
TOTAL EXPENSED COST	$ 15,830	$ 0	$ 0	$ 0
TOTAL INVESTMENT	$ 54,050	$ 0	$ 0	$ 0
TOTAL SAVINGS	$ 25,112	$ 23,202	$ 24,631	$ 25,862
DOD SHARE	$ 0	$ 23,134	$ 24,631	$ 25,862
OPTION3 PAYMENTS	$ 7,045	$ 7,045	$ 0	$ 0
SUBCONT SHARE OF SAVINGS	$ 32,157	$ 7,113	$ 0	$ 0
(WITH OPTION 3 PAYMENTS)				
COM RECOVERY	$ 44	$ 1,842	$ 1,371	$ 686
SUBCONTRACTOR BEFORE TAX IRR	.00%	.00%	7.70%	14.12%

INDUSTRIAL MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY7)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1989	1990	1991	TOTAL
INVESTMENTS				
BUDGETED & RECOVERED CAPITAL				
COST OF CAPITALIZED LABOR	$ 0	$ 0	$ 0	$ 25,370
COST OF CAPITALIZED EQUIPMENT	$ 0	$ 0	$ 0	$ 16,241
COST OF CAPITALIZED OTHER	$ 0	$ 0	$ 0	$ 3,123
WITH SALES TAX & MTL OVERHEAD				
TOTAL CAPITAL (AFTER % DOD BUSINESS)	$ 0	$ 0	$ 0	$ 38,220
BUDGETED & RECOVERED EXPENSED				
AFTER APPLYING PER CENT DOD BUSINESS				
TOTAL RECOVERED EXPENSED COST	$ 0	$ 0	$ 0	$ 1,584
UNRECOVERED EXPENSE				
TOTAL NON RECOVERED EXPENSED COST	$ 0	$ 0	$ 0	$ 14,246
TOTAL EXPENSED COST	$ 0	$ 0	$ 0	$ 15,830
TOTAL INVESTMENT	$ 0	$ 0	$ 0	$ 54,050
TOTAL SAVINGS	$ 27,156	$ 28,513	$ 29,939	$ 184,915
DOD SHARE	$ 27,156	$ 28,513	$ 29,939	$ 159,235
OPTION3 PAYMENTS	$ 0	$ 0	$ 0	$ 14,090
SUBCONT SHARE OF SAVINGS (WITH OPTION 3 PAYMENTS)	$ 0	$ 0	$ 0	$ 39,269
COM RECOVERY	$ (3)	$ (696)	$ (1,395)	$ 1,849
SUBCONTRACTOR BEFORE TAX IRR	17.97%	20.30%	21.70%	21.70%

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY7)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1985	1986	1987	1988
DOD SHARE TOTAL BUSINESS	80.00 %	80.00 %	80.00 %	80.00 %
DOD SHARE OF SAVINGS	100.00 %	100.00 %	100.00 %	100.00 %
INSTANT F16 (COST)	$ 6,204	$ 0	$ 0	$ 0
FOLLOWON F16 (COST)	$ 0	$ 5,982	$ 6,570	$ 6,899
INSTANT OTHER DOD (COST)	$ 14,337	$ 55	$ 0	$ 0
FOLLOWON OTHER DOD (COST)	$ 0	$ 12,921	$ 13,710	$ 14,395
INSTANT F16 (SELL)	$ 7,585	$ 0	$ 0	$ 0
FOLLOWON F16 (SELL)	$ 0	$ 7,321	$ 7,980	$ 8,379
INSTANT OTHER DOD (SELL)	$ 17,527	$ 68	$ 0	$ 0
FOLLOWON OTHER DOD (SELL)	$ 0	$ 15,813	$ 16,651	$ 17,484
RECOVERED INDIRECT	$ 1,584	$ 0	$ 0	$ 0
RECOVERED DEPR (CAS 409)	$ 4,914	$ 4,914	$ 4,914	$ 4,914
UNRECOVERED INDIRECT	$ 14,246	$ 0	$ 0	$ 0

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY7)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1989	1990	1991	TOTAL
DOD SHARE TOTAL BUSINESS	80.00 %	80.00 %	80.00 %	
DOD SHARE OF SAVINGS	100.00 %	100.00 %	100.00 %	
INSTANT F16 (COST)	$ 0	$ 0	$ 0	$ 6,204
FOLLOWON F16 (COST)	$ 7,243	$ 7,606	$ 7,986	$ 42,286
INSTANT OTHER DOD (COST)	$ 0	$ 0	$ 0	$ 14,392
FOLLOWON OTHER DOD (COST)	$ 15,115	$ 15,871	$ 16,664	$ 88,675
INSTANT F16 (SELL)	$ 0	$ 0	$ 0	$ 7,585
FOLLOWON F16 (SELL)	$ 8,798	$ 9,238	$ 9,699	$ 51,414
INSTANT OTHER DOD (SELL)	$ 0	$ 0	$ 0	$ 17,595
FOLLOWON OTHER DOD (SELL)	$ 18,358	$ 19,276	$ 20,240	$ 107,821
RECOVERED INDIRECT	$ 0	$ 0	$ 0	$ 1,584
RECOVERED DEPR (CAS 409)	$ 4,914	$ 4,914	$ 4,914	$ 34,398
UNRECOVERED INDIRECT	$ 0	$ 0	$ 0	$ 14,246

```
ELEMENT IF@SMJ.CMASSY7 05/23/85 13:10
MICRO &PR   CT&COUNTERMEASURES ASSEMBLY IMPROVEMENTS
MICRO &YEARS&1985,1986,1987,1988,1989,1990,1991,TOTAL&
MICRO &COLUMNS&7&
MICRO &COLUMNS-1&6&
SALES TAX RATE = .05125
COST OF CAPITALIZED LABOR = 25370,0
COST OF CAPITALIZED EQUIPMENT = 16241,0
COST OF CAPITALIZED OTHER = 3123,0
NON RECOVERED CAPITALIZED COSTS = 0
RECOVERED EXPENSED COSTS = 1980,0
NONRECOVERED EXPENSED COSTS = 17807,0
F SIX INSTANT DIRECT DOLLAR SAVINGS = 2066,0
F SIX FOLLOW ON DIRECT DOLLAR SAVINGS = 0,2163,2388,PREVIOUS * 1.05 FOR 4,0
OTHER DOD INSTANT DIRECT DOLLAR SAVINGS = 4774,20,0
OTHER DOD FOLLOW ON DIRECT DOLLAR SAVINGS = 0,4672,4983,PREVIOUS * 1.05 FOR 4,0
GOVT INSTANT DIRECT DOLLAR SAVINGS = 6840,20,0
COMMERCIAL DIRECT DOLLAR SAVINGS = 2234,2438,2616,PREVIOUS * 1.05 FOR 4,0
GOVT FOLLOW ON DIRECT DOLLAR SAVINGS = 0,6835,7371,PREVIOUS * 1.05 FOR 4,0
DIRECT VARIABLE LABOR DOLLARS SAVED = 1
DIRECT FIXED LABOR DOLLARS SAVED = 0
AVERAGE DIRECT LABOR RATE = 1
MFG RATE = 1.58,1.38
ENG RATE = 0
MH RATE = .12
MFG COM RATE =.19577,.18162,.16015
ENG COM RATE = 0
MH COM RATE = 0
GA RATE =.164,.162,.156
GA COM RATE = .00851,.00952,.00734
FEE RATE = .15
EQUIPMENT LIFE = 5
INSTANT DOD FACTOR = 0
DOD FACTOR = 1
COM FACTOR = .12125
INCOME TAX RATE = .46
ITC RATE = .1
DISCOUNT RATE = .12
PER CENT DOD BUSINESS = .8
YEAR = 1985,PREVIOUS + 1
EQUIP LIFE SL = 7
MATERIAL COST SAVED = 0
OPTION3 PAYMENTS = 7045,7045,0
END OF DATAFILE
```

Tracor Aerospace

Tracor Inc
6500 Tracor Lane
Austin Texas 78721
Telephone 512 926 2800

January 10, 1986

RGL-86-01-10

General Dynamics
Fort Worth Division
P. O. Box 748
Fort Worth, Texas 76101

Attention: Harvey Patton, MZ #1400/Dept. 082
ITM Program Administrator

SUBJECT: Revision "C" Pages to Countermeasures Assembly Improvements Project Proposal and Tracor's Responses To Questions Raised During December 9-11, 1985 Fact Finding on Coordinate Measuring Machine and Finishing Shop Project

Gentlemen:

Enclosed are our responses to the questions you raised during Fact Finding. The responses have been segregated by major topic, information provided during Fact Finding, responses provided herein, and other data to follow.

Responses Concerning General Program
Provided during Fact Finding:
- o 4th. Quarter, 1985 Bid Package dated October 31, 1985.

Provided herein:
- GP-1 Amendment to 4th. Quarter Bid Package dated December 17, 1985.
- GP-2 Procedure for going from Tracor model to Form 1411.

Data to follow:
- o Memorandum of Negotiations on 4th. Quarter Bid Package.

[redacted]

- o [redacted] Proposal.

[redacted]

Volume I-Attachments A, G, and H.
Volume II-All Pages.

CAI-2 Summary of Reasons for Changes to Proposal.

Responses concerning Coordinate Measuring Machine

Provided during Fact Finding:

- o Direct #'s sheet (prepared by Project Investigator) representing project savings.

Provided herein:

CMM-1 Cost sheet showing overall program investment.

Responses concerning Finishing Shop Proposal (Revision A)

Provided during Fact Finding:

- o Tracor IFPS IRR Model TMIRR5 Results Reports for datafiles FINSHP11 and FINSHP12, reports dated December 10, 1985.
- o GD DCF Model report using FINSHP11 data of December 10.
- o November 1985 Act/Bud for Construction In Progress (CIP) 905 and 905-01.
- o Cost of Projects (COP) September 30 and November 30, 1985 for CIP 905.
- o Labor estimates dated October 22, and December 5, 1985 from Pat Casey.
- o Monthly labor run for CIP 905 dated November 23, 1985.
- o Tracor Manufacturing Control System (TMCS) printouts for equipment (supports p.109 data); also some invoices, PR's, and PO's.
- o OHYTDC dated September 30, 1985 and Overhead Charges Reports for 1984 to support p.110 data.
- o FIR 85-092 with allocation sheets.
- o Example of Production Work Order (PWO) for PN 134008-0001, Breech Plate. (4pp.)
- o MTS calculations ("before" and "after") for Chem-Film, Anodize, Passivation, and Painting. (28pp.)
- o MTS Standards for various work elements. (1p)

Provided herein:

FS-1 Updated FIR 85-092 allocation schedule for Finishing Shop Project.

FS-2 Updated OHYTDC (November 1985) to support Finishing Shop expensed charges.

FS-3 Disposition of Equipment being replaced in Finishing Shop.

FS-4 Paint consumption during 24 months period. (1p.) Back-up for p.98 of proposal.

FS-5 Calculation of percent savings in the 12 main routing patterns (12pp.). Back-up for savings percentages on p.89 of proposal.

FS-6 Copy of instructions used to enter proposed build quantities into computer. (2pp.) Referred to on p.95 of proposal.

FS-7 Approximate annual chem-film production based on chem-film work in various routing patterns. (1p.) Referred to on p.16 of proposal.
FS-8 Printout of savings per deliverable LRU. (229pp.)
FS-9 Printout of man-hour savings, Finishing Shop, by customer category (F-16, USAF, DoD, Com'l), by year (1986-1993), including Instant and Follow-On.

Data to follow will be submitted under Revision "B" to the proposal:

- o Updates to I.R.R. model.

If you desire additional information, please let us know.

Sincerely,

Ralph G. Leigh
Manager, General Contracts
Administration

/bc

Tracor Aerospace
Aerospace Austin

Revision C

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

Phase III Proposal

Attachment A - Project Economic Summary

Implementation Date:		Jan 86
Man-Hour Savings	Instant F-16	169.0
	Future F-16	1,006.6
	Instant Other DoD	1,946.9
	Future Other DoD	5,068.9
	TOTAL	8,191.4
Labor and Material Savings (Loaded $'s thru fees)	Instant F-16	$ 5,337
	Future F-16	$ 39,056
	Instant Other DoD	$ 55,843
	Future Other DoD	$ 144,071
	TOTAL	$ 244,307
Internal Rate of Return (Before tax in 4th year)		20.0%
Subcontractors Capital Funds:		$ 27,181
Subcontractors Related Funds:		$ 11,698
DoD Funds:		$

CAE-

Summary of △'s to CM Assy Proposal 905-1063B

- Cablescan savings - Due to rate changes, implementation date, and Instant vs F-0 allocation.

- Other savings - Due to rate changes, implementation date, Instant vs F-0 allocation, and changes in the F-16, other Govt, and Commercial Savings allocations.

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES

Revision C

PART#	F16:85I	F16:86I	F16:87I	F16:88I	F16:89I	OTGOVT:85I	OTGOVT:86I	OTGOVT:87I	OTGOVT:88I	OTGOVT:89I	COMML:85I	COMML:86I	COMML:87I	COMML:88I	COMML:89I
130826-0001	0	0	0	0	0	0	0	0	0	0	0	112	0	0	0
130836-0001	0	0	0	0	0	0	0	0	0	0	1	59	0	0	0
131432-0001	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
131437-0002	0	0	0	0	0	0	0	0	0	0	10	6	0	0	0
132276-0001	0	0	0	0	0	0	0	0	0	0	0	327	0	0	0
132260-0001	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
133490-2001	0	0	0	0	0	2	3	0	0	0	0	22	0	0	0
133490-2002	0	0	0	0	0	13	86	0	0	0	0	22	0	0	0
133686-0001	0	0	30	0	0	20	95	0	0	0	14	164	0	0	0
133686-0002	0	0	0	0	0	0	0	0	0	0	14	4	0	0	0
133797-0001	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
133798-0001	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
133803-0001	0	124	195	37	0	1	252	23	44	0	0	162	0	0	0
133880-0002	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0
133823-0001	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
133834-0001	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
133882-0001	0	0	0	0	0	12	0	0	0	0	0	22	0	0	0
133682-0002	0	0	0	0	0	12	0	0	0	0	0	22	0	0	0
133896-0001	0	0	0	0	0	14	311	296	0	0	17	166	0	0	0
134001-0001	0	0	0	0	0	17	734	1262	1260	630	0	64	0	0	0
134003-0002	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
134004-0002	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
134010-0001	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
134011-0001	0	0	0	0	0	0	200	0	0	0	0	0	0	0	0
134016-0001	0	0	0	0	0	10	22	0	0	0	0	2	0	0	0
134025-0001	0	0	0	0	0	0	0	0	0	0	0	54	0	0	0
134025-0002	0	0	0	0	0	17	874	793	721	65	0	0	0	0	0
134036-0001	0	0	0	0	0	24	0	0	0	0	0	44	0	0	0
135402-0004	0	0	0	0	0	3	11	0	0	0	0	0	0	0	0
135402-0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135403-0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135501-0001	0	0	0	0	0	14	4	0	0	0	0	0	0	0	0
135404-0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135405-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PARTN	F16:85I	F16:86I	F16:87I	F16:88I	F16:89I	OTGOVT:85I	OTGOVT:86I	OTGOVT:87I	OTGOVT:93I	OTGOVT:89I	COMML:65I	COMML:86I	COMML:87I	COMML:88I	COMML:89I
135606-0001	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
135609-0001	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
135619-0001	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
135622-0004	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0
135623-0001	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0
135627-0001	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
135627-0002	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
135630-0001	0	0	0	0	0	1	0	0	0	0	0	10	0	0	0
135630-0002	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
135633-0001	0	0	0	0	0	9	26	0	0	0	0	0	0	0	0
135633-0002	0	0	0	0	0	1	14	0	0	0	0	0	0	0	0
135734-0002	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
135928-0003	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
135928-0004	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
135950-0110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135978-0001	0	30	269	0	0	36	604	91	58	0	1	0	0	0	0
135994-0001	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
135998-0002	30	56	522	0	0	35	632	78	59	0	0	0	0	0	0
135998-0003	0	0	0	0	0	13	398	163	0	0	0	0	0	0	0
135912-0001	0	17	281	0	0	181	1117	293	0	0	14	0	0	0	0
135912-0002	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0
135927-0002	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0
135938-0001	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
135944-0001	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0
135945-0001	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0
135947-0001	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0
136527-0001	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
136530-0001	0	0	0	0	0	0	49	0	0	0	0	0	0	0	0
136534-0001	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
136540-0001	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
136550-0001	0	0	0	0	0	1	16	0	0	0	0	0	0	0	0
136560-0001	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
136570-0001	0	0	0	0	0	32	9	0	0	0	0	0	0	0	0
136580-0001	0	0	0	0	0	16	6	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:85I	F16:86I	F16:87I	F16:88I	F16:89I	OTGOVT:85I	OTGOVT:86I	OTGOVT:87I	OTGOVT:88I	OTGOVT:89I	COMML:85I	COMML:86I	COMML:87I	COMML:88I	COMML:89I
136654-0001	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
136664-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136709-0001	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
139258-0001	0	0	0	0	0	1206	0	0	0	0	0	91	0	0	0
139293-0001	0	0	0	0	0	24	0	0	0	0	1	57	0	0	0
139648-0001	0	0	0	0	0	0	0	0	0	0	1	98	0	0	0
139651-0001	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
139651-0002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140477-0001	0	0	0	0	0	94	0	0	0	0	0	0	0	0	0
140479-0001	0	0	0	0	0	10	238	0	0	0	0	0	0	0	0
140479-0002	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
140497-0001	0	0	0	0	0	32	367	0	0	0	20	0	0	0	0
140967-0001	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0
141020-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141020-0002	0	0	0	0	0	0	1	0	0	0	23	492	234	0	0
141030-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141030-0003	0	0	0	0	0	0	1	0	0	0	6	127	71	0	0
141041-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141047-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141047-0002	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141050-0001	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
141053-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141056-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141062-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141075-0004	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0
141079-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141082-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141102-0002	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
141107-0001	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
141150-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141154-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141175-0001	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
141176-0001	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
141181-0001	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F15:85	F15:86	F15:87	F16:85	F14:85	OTGOVT:85	OTGOVT:86	OTGOVT:87	OTGOVT:88	OTGOVT:89	COMPL:85	COMPL:86	COMPL:87	COMPL:88	COMPL:89
141184-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141194-0001	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
141198-0001	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
141203-0002	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
141206-0002	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
141209-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
141218-0002	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
141213-0001	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
141222-0001	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
142035-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142202-0002	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0
142242-0001	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0
142227-0001	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
142242-0001	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
142243-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142252-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142266-0001	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
142279-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142288-0001	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
142800-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
142811-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
143017-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
143112-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143115-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143119-0001	0	0	0	0	0	0	0	0	0	0	50	600	100	0	0
143128-0001	0	0	0	0	0	0	0	0	0	0	53	320	0	0	0
143121-0001	0	0	0	0	0	0	0	0	0	0	0	515	0	0	0
145168-0002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145224-0002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145283-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145284-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145285-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145287-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145291-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

P- _ NO. 00005
01 02/86

PART#	F16:85]	F16:86]	F16:87]	F16:88]	F16:89]	OTGOVT:85]	OTGOVT:86]	OTGOVT:87]	OTGOVT:88]	OTGOVT:89]	COMML:85]	COMML:86]	COMML:87]	COMML:88]	COMML:89]
145568-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145570-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145576-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145758-0001	0	0	0	0	0	0	477	81	0	0	0	0	0	0	0
148001-0001	0	0	0	0	0	33	956	0	0	0	0	0	0	0	0
148002-0001	0	0	0	0	0	33	488	0	0	0	0	0	0	0	0
149003-0001	0	0	0	0	0	176	0	0	0	0	0	0	0	0	0
148075-0001	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0
148125-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148130-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
148250-0001	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0
148250-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148320-0001	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
148322-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
149325-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
148331-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148370-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149451-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148351-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148162-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
148172-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
151037-0001	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
154451-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155158-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155203-0001	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
156450-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157400-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157460-0001	0	0	0	0	0	177	2447	0	0	0	0	0	0	0	0
157350-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157375-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157925-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158330-0001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
** TOTAL **															
	34	227	1574	37	0	2234	10317	3179	2143	675	348	3757	538	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOVT:86F	OTGOVT:87F	OTGOVT:88F	OTGOVT:89F	CONTL:86F	CONTL:87F	CONTL:88F	CONTL:89F
130026-0001	0	0	0	0	0	0	0	0	0	0	0	0
130396-0001	0	0	0	0	0	0	0	0	0	0	0	0
131432-0001	0	0	0	0	0	0	0	0	0	0	0	0
131437-0002	0	0	0	0	0	0	0	0	0	0	0	0
132278-0001	0	0	0	0	0	0	0	0	0	0	0	0
132293-0001	0	0	0	0	0	0	0	0	0	0	0	0
133452-0001	0	0	0	0	0	0	0	0	1	0	0	0
133470-0002	0	0	0	0	0	0	0	0	0	0	0	0
133686-0001	0	0	0	0	0	0	0	0	0	0	0	0
133686-0002	0	0	0	0	0	0	0	0	0	0	0	0
133797-0001	0	0	0	0	0	0	0	0	0	0	0	0
133798-0001	0	0	0	0	0	0	0	0	0	0	0	0
133829-0001	39	136	133	133	21	299	289	289	33	134	134	134
133930-0002	0	0	0	0	0	0	0	0	0	0	0	0
133933-0001	0	0	0	0	0	0	0	0	0	0	0	0
133934-0001	0	0	0	0	0	0	0	0	0	0	0	0
133952-0001	0	0	0	0	0	0	0	0	1	0	0	0
133953-0002	0	0	0	0	0	0	0	0	0	0	0	0
133956-0001	0	0	0	0	0	0	0	0	0	0	0	0
134001-0001	0	0	0	0	0	0	0	0	1	0	0	0
134003-0002	0	0	0	0	0	0	0	0	0	0	0	0
134004-0002	0	0	0	0	0	0	0	0	0	0	0	0
134010-0001	0	0	0	0	0	0	0	0	0	0	0	0
134011-0001	0	0	0	0	0	0	0	0	0	0	0	0
134016-0001	0	0	0	0	21	133	163	183	9	25	25	25
134025-0001	0	0	0	0	0	0	0	0	1	0	0	0
134025-0002	0	0	0	0	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:84F	F16:87F	F16:88F	F16:89F	OTGOVT:84F	OTGOVT:87F	OTGOVT:88F	OTGOVT:89F	COMIL:84F	COMIL:87F	COMIL:89F	COMIL:89F
134034-0001	0	0	0	0	1	94	94	94	9	35	35	35
135602-0004	0	0	0	0	0	0	0	0	0	0	0	0
135602-0300	0	0	0	0	0	0	0	0	0	0	0	0
135603-0300	0	0	0	0	0	0	0	0	0	0	0	0
135604-0001	0	0	0	0	0	0	0	0	0	0	0	0
135604-0500	0	0	0	0	0	0	0	0	0	0	0	0
135605-0001	0	0	0	0	0	0	0	0	0	0	0	0
135606-0001	0	0	0	0	0	0	0	0	0	0	0	0
135609-0001	0	0	0	0	0	0	0	0	0	0	0	0
135619-0001	0	0	0	0	0	0	0	0	0	0	0	0
135622-0004	0	0	0	0	0	0	0	0	0	0	0	0
135623-0001	0	0	0	0	0	0	0	0	0	0	0	0
135627-0001	0	0	0	0	0	0	0	0	0	0	0	0
135627-0002	0	0	0	0	0	0	0	0	0	0	0	0
135630-0001	0	0	0	0	0	0	0	0	0	0	0	0
135630-0002	0	0	0	0	0	0	0	0	0	0	0	0
135633-0001	0	0	0	0	0	0	0	0	0	0	0	0
135633-0002	0	0	0	0	0	0	0	0	0	0	0	0
135634-0002	0	0	0	0	0	0	0	0	0	0	0	0
135639-0003	0	0	0	0	0	0	0	0	48	164	164	164
135639-0004	0	0	0	0	0	0	0	0	0	0	0	0
135650-0113	0	0	0	0	0	0	0	0	0	0	0	0
135670-0001	46	294	294	294	17	142	142	142	0	44	44	44
135694-0001	0	0	0	0	0	0	0	0	0	0	0	0
135699-0002	91	596	596	596	0	0	0	0	7	195	195	195
135699-0003	0	0	0	0	0	197	197	197	0	0	0	0
135712-0001	0	0	0	0	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOUT:86F	OTGOUT:87F	OTGOUT:88F	OTGOUT:89F	COMIL:86F	COMIL:87F	COMIL:88F	COMIL:89F
135912-0002	0	0	0	0	0	0	0	0	0	0	0	0
135929-0002	0	0	0	0	0	0	0	0	0	0	0	0
135933-0001	0	0	0	0	0	0	0	0	0	0	0	0
135944-0001	0	0	0	0	0	0	0	0	0	0	0	0
135945-0001	0	0	0	0	0	0	0	0	0	0	0	0
135947-0001	0	0	0	0	0	0	0	0	0	0	0	0
136527-0001	0	0	0	0	0	0	0	0	0	0	0	0
136530-0001	0	1	1	1	4	178	178	178	36	171	171	171
136534-0001	0	0	0	0	0	0	0	0	0	0	0	0
136548-0001	0	0	0	0	0	0	0	0	0	0	0	0
136558-0001	0	0	0	0	0	0	0	0	0	0	0	0
136568-0001	0	0	0	0	0	0	0	0	0	0	0	0
136578-0001	0	0	0	0	0	0	0	0	0	0	0	0
136588-0001	0	0	0	0	4	94	94	94	9	26	26	26
136654-0001	0	0	0	0	0	0	0	0	0	0	0	0
136666-0001	0	0	0	0	0	0	0	0	0	0	0	0
136706-0001	0	0	0	0	0	0	0	0	0	0	0	0
138238-0001	0	0	0	0	0	0	0	0	0	0	0	0
139293-0001	0	0	0	0	0	0	0	0	0	0	0	0
139648-0001	0	0	0	0	0	0	0	0	0	0	0	0
139651-0001	0	0	0	0	17	89	89	89	0	88	88	88
139651-0002	0	0	0	0	0	0	0	0	0	0	0	0
140477-0001	0	0	0	0	0	0	0	0	0	0	0	0
140479-0001	0	0	0	0	0	0	0	0	0	0	0	0
140479-0002	0	0	0	0	0	0	0	0	0	0	0	0
140487-0001	44	294	294	294	0	0	0	0	1	53	53	53
140867-0001	0	0	0	0	35	179	179	179	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOVT:86F	OTGOVT:87F	OTGOVT:88F	OTGOVT:89F	CONTL:86F	CONTL:87F	CONTL:88F	CONTL:89F
141020-0001	0	0	0	0	0	0	0	0	0	0	0	0
141030-0002	0	0	0	0	193	894	894	894	0	0	0	0
141030-0001	0	1	1	1	47	223	223	223	1	60	60	60
141030-0003	0	0	0	0	0	0	0	0	0	0	0	0
141044-0001	0	0	0	0	0	0	0	0	0	0	0	0
141047-0001	0	0	0	0	0	0	0	0	0	0	0	0
141047-0002	0	0	0	0	0	0	0	0	0	0	0	0
141050-0001	0	0	0	0	0	0	0	0	0	0	0	0
141053-0001	0	0	0	0	0	0	0	0	0	0	0	0
141056-0001	0	0	0	0	0	0	0	0	0	0	0	0
141062-0001	0	0	0	0	0	0	0	0	0	0	0	0
141075-0001	0	0	0	0	0	0	0	0	0	0	0	0
141079-0001	0	0	0	0	0	0	0	0	0	0	0	0
141082-0001	0	0	0	0	0	0	0	0	0	0	0	0
141102-0002	0	0	0	0	0	0	0	0	0	0	0	0
141107-0001	0	0	0	0	0	0	0	0	0	0	0	0
141150-0001	0	0	0	0	0	0	0	0	0	0	0	0
141154-0001	0	0	0	0	0	0	0	0	0	0	0	0
141175-0001	0	0	0	0	0	0	0	0	0	0	0	0
141176-0001	0	0	0	0	0	0	0	0	0	0	0	0
141181-0001	0	0	0	0	0	0	0	0	0	0	0	0
141184-0001	0	0	0	0	0	0	0	0	0	0	0	0
141184-0001	0	0	0	0	0	0	0	0	0	0	0	0
141185-0001	0	0	0	0	0	0	0	0	0	0	0	0
141203-0002	0	0	0	0	0	0	0	0	0	0	0	0
141204-0002	0	0	0	0	0	0	0	0	0	0	0	0
141209-0001	0	0	0	0	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOVT:86F	OTGOVT:87F	OTGOVT:88F	OTGOVT:89F	COMML:86F	COMML:87F	COMML:88F	COMML:89F
141210-0002	0	0	0	0	0	0	0	0	0	0	0	0
141213-0001	0	0	0	0	0	0	0	0	0	0	0	0
141222-0001	0	0	0	0	0	0	0	0	0	0	0	0
142035-3001	0	0	0	0	0	0	0	0	0	0	0	0
142200-0002	0	0	0	0	0	0	0	0	0	0	0	0
142242-0701	0	0	0	0	0	0	0	0	0	0	0	0
142927-0001	0	0	0	0	0	0	0	0	0	0	0	0
142942-0001	0	0	0	0	0	0	0	0	0	37	37	37
142945-0001	0	0	0	0	0	0	0	0	0	0	0	0
142952-0001	0	0	0	0	0	0	0	0	0	0	0	0
142966-0001	0	0	0	0	0	0	0	0	0	0	0	0
142975-0001	0	0	0	0	0	0	0	0	0	0	0	0
142998-0001	0	0	0	0	0	0	0	0	0	0	0	0
143008-0001	0	0	0	0	0	0	0	0	0	0	0	0
143011-0001	0	0	0	0	0	0	0	0	0	0	0	0
143017-0001	0	0	0	0	0	0	0	0	0	0	0	0
142112-0001	0	0	0	0	0	0	0	0	0	0	0	0
143115-0001	0	0	0	0	0	0	0	0	0	0	0	0
143119-0001	0	0	0	0	0	0	0	0	0	0	0	0
143120-0001	0	0	0	0	0	0	0	0	0	0	0	0
143121-0001	0	0	0	0	0	0	0	0	0	0	0	0
145100-0002	0	0	0	0	0	0	0	0	0	0	0	0
145124-0002	0	0	0	0	0	0	0	0	0	0	0	0
145303-0001	0	0	0	0	0	0	0	0	0	0	0	0
145304-0001	0	0	0	0	0	0	0	0	0	0	0	0
145335-0001	0	0	0	0	0	0	0	0	0	0	0	0
145339-0001	0	0	0	0	0	0	0	0	0	0	0	0

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOVT:86F	OTGOVT:87F	OTGOVT:88F	OTGOVT:89F	COMIL:86F	COMIL:87F	COMIL:88F	COMIL:89F
145550-0001	0	0	0	0	0	0	0	0	0	0	0	0
145560-0001	0	0	0	0	0	0	0	0	0	0	0	0
145570-0001	0	0	0	0	0	0	0	0	0	0	0	0
145576-0001	0	0	0	0	0	0	0	0	0	0	0	0
145758-0001	0	0	0	0	0	0	0	0	0	0	0	0
148381-0001	0	0	0	0	0	0	0	0	0	0	0	0
148002-0001	0	0	0	0	0	0	0	0	0	0	0	0
149003-0001	0	0	0	0	0	0	0	0	0	0	0	0
148075-0001	0	0	0	0	0	0	0	0	0	0	0	0
148125-0001	0	0	0	0	0	0	0	0	16	11	11	11
149130-0001	0	0	0	0	0	0	0	0	0	0	0	0
149250-0001	0	0	0	0	0	0	0	0	32	22	22	22
149253-0001	0	0	0	0	0	0	0	0	0	0	0	0
149320-0001	0	0	0	0	0	0	0	0	0	0	0	0
149322-0001	0	0	0	0	0	0	0	0	0	0	0	0
149325-0001	0	0	0	0	0	0	0	0	0	0	0	0
149331-0001	0	0	0	0	0	0	0	0	0	0	0	0
149378-0001	0	0	0	0	0	0	0	0	0	0	0	0
149451-0001	0	0	0	0	0	0	0	0	16	11	11	11
149454-0001	0	0	0	0	0	0	0	0	0	0	0	0
149462-0001	0	0	0	0	0	0	0	0	0	0	0	0
149472-0001	0	0	0	0	0	0	0	0	0	0	0	0
154097-0001	0	0	0	0	0	0	0	0	0	0	0	0
154451-0001	0	0	0	0	0	0	0	0	0	0	0	0
155100-0001	0	0	0	0	0	0	0	0	0	10	10	10
155200-0001	0	0	0	0	0	0	0	0	0	0	0	0
154450-0001	1	1	1	1	0	389	389	389	4	156	156	156

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT
ATTACHMENT G - MANUFACTURING SCHEDULES (CONT.)

Revision C

PART#	F16:86F	F16:87F	F16:88F	F16:89F	OTGOUT:86F	OTGOUT:87F	OTGOUT:88F	OTGOUT:89F	COMIL:86F	COMIL:87F	COMIL:88F	COMIL:89F
157600-0001	0	0	0	0	0	0	0	0	0	0	0	0
157698-0001	0	0	0	0	0	0	0	0	0	0	0	0
157858-0001	0	1	1	1	0	84	84	84	1	54	54	54
157875-0001	0	0	0	0	0	672	672	672	0	0	0	0
157925-0001	0	0	0	0	0	84	84	84	0	0	0	0
159533-0001	0	0	0	0	0	89	89	89	0	0	0	0
** TOTAL **	223	1317	1317	1317	349	3710	3710	3710	232	1332	1332	1332

Tracor Aerospace
Aerospace Austin

Revision C

ATTACHMENT G

COUNTERMEASURES ASSEMBLY ALLOCATION %'s OF BUILD SCHEDULE

	1985	1986	1987	1988	1989	1990
Instant						
F-16	30	227	1574	37		
	1%	1.5%	14%	.5%		
Other DoD	2284	10917	3179	2142	695	
	86%	69.5%	27%	25%	10%	
Commercial	348	3757	538			
	13%	24%	5%			
Follow-On						
F-16		223	1317	1317①	1317①	1317①
		1.5%	11%	15%	19%	21%
Other DoD		360	3710	3710①	3710①	3710①
		2%	32%	43.5%	52%	58%
Commercial		232	1332	1332①	1332①	1332①
		1.5%	11%	16%	19%	21%

① Assumes on going level of effort

NOTES:
- o 1985 is 1/3 (7/85-12/85) of total '85 Build.
- o Instant #'s from Pat Casey's 10/4/85 computer run and isolates LRU's for CM.
- o Follow-On #'s from Mike Andrews' worksheets dated 9-26-85.

Tracor Aerospace
Aerospace Austin

Revision C

FLEX SCHEDULE
12-23-85

		1986	1987	1988-92	Test Time Per Part in Hours
Quantities					
141203-0001	Instant	653	128	0	.08
	F-0	190	894	1022	
141206-0001	Instant	653	128	0	.07
	F-0	190	894	1022	
141209-0001	Instant	653	128	0	.14
	F-0	190	894	1022	
141210-0001	Instant	653	128	0	.08
		190	894	1022	
Test Time in Hours Per Year:	Instant	241.6	47.4	0	
	F-0	70.3	330.8	378.1	

NOTE: All F-15, No foreign.

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H – SAVINGS CALCULATIONS (1)

Revision C

	INSTANT SAVINGS					FOLLOW-ON SAVINGS						
	1985	1986	1987	1988	1989	1986	1987	1988	1989	1990	1991	1992
F-16												
Stockroom relocation	2.0 hrs	8.9 hrs	82.7 hrs	3.0 hrs		8.9 hrs	65.0 hrs	88.7 hrs	112.3 hrs	124.1 hrs	124.1 hrs	83.1 hrs
S7	x $ 10.31	x $ 10.77	x $ 11.42	x $ 12.10		x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 21	$ 96	$ 944	$ 36		$ 96	$ 742	$1,073	$1,440	$1,688	$1,789	$1,269
Sort parts at workstation	1.4	6.3	59.2	2.1		6.3	46.5	63.5	80.4	88.8	88.8	59.5
M7	x $ 6.13	x $ 6.40	x $ 6.79	x $ 7.20		x $ 6.40	x $ 6.79	x $ 7.20	x $ 7.63	x $ 8.08	x $ 8.57	x $ 9.08
	$ 9	$ 40	$ 402	$ 15		$ 40	$ 316	$ 457	$ 613	$ 718	$ 761	$ 540
Staging method change	.1	.3	2.9	.1		.3	2.3	3.2	4.0	4.4	4.4	3.0
S7	x $ 10.31	x $ 10.77	x $ 11.42	x $ 12.10		x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 1	$ 3	$ 33	$ 1		$ 3	$ 26	$ 39	$ 51	$ 60	$ 63	$ 46
TOTAL	$ 31	$ 139	$ 1,379	$ 52		$ 139	$ 1,084	$ 1,569	$ 2,104	$ 2,466	$ 2,613	$ 1,855
Other DoD												
Stockroom relocation	169.4 hrs	410.7 hrs	159.6 hrs	147.8 hrs	59.1 hrs	11.8 hrs	189.1 hrs	257.1 hrs	307.3 hrs	342.8 hrs	342.8 hrs	229.7 hrs
S7	x $ 10.31	x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 1,747	$ 4,423	$ 1,823	$ 1,788	$ 758	$ 127	$ 2,160	$ 3,110	$ 3,943	$ 4,662	$ 4,942	$ 3,508
Sort parts at workstation	121.3	294.0	114.2	105.8	42.3	8.5	135.4	184.0	220.0	245.3	245.3	164.4
M7	x $ 6.13	x $ 6.40	x $ 6.79	x $ 7.20	x $ 7.63	x $ 6.40	x $ 6.79	x $ 7.20	x $ 7.63	x $ 8.08	x $ 8.57	x $ 9.08
	$ 744	$ 1,882	$ 775	$ 762	$ 323	$ 54	$ 919	$ 1,325	$ 1,679	$ 1,982	$ 2,101	$ 1,493
Cablescan		241.6	47.4			70.3	330.8	378.1	378.1	378.1	378.1	378.1
M9-M7		x $ 3.84	x $ 4.08			x $ 3.84	x $ 4.08	x $ 4.32	x $ 4.58	x $ 4.86	x $ 5.15	x $ 5.46
		$ 928	$ 193			$ 270	$ 1,350	$ 1,633	$ 1,732	$ 1,838	$ 1,947	$ 2.064
Staging method change	6.0	14.6	5.7	5.3	2.1	.4	6.7	9.1	10.9	12.2	12.2	8.2
S7	x $ 10.31	x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 62	$ 157	$ 65	$ 64	$ 27	$ 4	$ 77	$ 110	$ 140	$ 166	$ 176	$ 125
TOTAL	$ 2,553	$ 7,390	$ 2,856	$ 2,614	$ 1,108	$ 455	$ 4,506	$ 6,178	$ 7,494	$ 8,648	$ 9.166	$ 7,190
TOTAL GOVT	$ 2,584	$ 7,529	$ 4,235	$ 2,666	$ 1,108	$ 594	$ 5,590	$ 7,747	$ 9,598	$11,114	$11,779	$ 9,045

COUNTERMEASURES ASSEMBLY IMPROVEMENTS PROJECT

ATTACHMENT H - SAVINGS CALCULATIONS① (CONT.)

Revision C

	INSTANT SAVINGS					FOLLOW-ON SAVINGS						
	1985	1986	1987	1988	1989	1986	1987	1988	1989	1990	1991	1992
Commercial												
Stockroom relocation	25.6 hrs	141.8 hrs	29.6 hrs			8.9 hrs	65.0 hrs	94.6 hrs	112.3 hrs	124.1 hrs	124.1 hrs	83.1 hrs
S7	x $ 10.31	x $ 10.77	x $ 11.42			x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 264	$ 1,527	$ 338			$ 96	$ 742	$ 1,145	$ 1,441	$ 1,688	$ 1,789	$ 1,269
Sort parts at workstation	18.3	101.5	21.2			6.3	46.5	67.7	80.4	88.8	88.8	59.5
M7	x $ 6.13	x $ 6.40	x $ 6.79			x $ 6.40	x $ 6.79	x $ 7.20	x $ 7.63	x $ 8.08	x $ 8.57	x $ 9.08
	$ 112	$ 650	$ 144			$ 40	$ 316	$ 487	$ 613	$ 718	$ 761	$ 540
Staging method change	.9	5.0	1.1			.3	2.3	3.4	4.0	4.4	4.4	3.0
S7	x $ 10.31	x $ 10.77	x $ 11.42			x $ 10.77	x $ 11.42	x $ 12.10	x $ 12.83	x $ 13.60	x $ 14.41	x $ 15.27
	$ 9	$ 54	$ 13			$ 3	$ 26	$ 41	$ 51	$ 60	$ 63	$ 46
TOTAL	$ 385	$ 2,231	$ 495			$ 139	$ 1,084	$ 1,673	$ 2,105	$ 2,466	$ 2,613	$ 1,855

① Allocations based on total Countermeasures Assembly LRU's in 1985 thru 1989. (see Attach. "G")
%'s used on all but Cablescan Savings.

NOTE: Hourly rates from 10/31/85 Bid Package, but P.S.I. is from 12/11/85 package submission to DCAS/DCAA. Also, Overhead rates use latter submission.

Procedure for Going From Tracor Model to
Form 1411 Column 8.D.

- Find the "total" column in the Tracor Model (the 1st results report)
- Find 4 variables: ① Total Savings
  ② DoD Share
  ③ Option 3 payments
  ④ Subcont Share of Savings
  (with option 3 payments)
- ① goes to 1st line of column 8.D.
- ② goes to 2nd line of column 8.D.
- ④ goes to 3rd line of column 8.D.
- (④ - ③) + ② = ①

Volume II 2.0

INDUSTRIAL MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1985	1986	1987	1988
INVESTMENTS				
BUDGETED & RECOVERED CAPITAL				
COST OF CAPITALIZED LABOR	$ 13,859	$ 0	$ 0	$ 0
COST OF CAPITALIZED EQUIPMENT(NO TAX,OH)	$ 14,826	$ 0	$ 0	$ 0
COST OF CAPITALIZED OTHER (NO TAX)	$ 2,605	$ 0	$ 0	$ 0
TOTAL CAPITAL (AFTER % DOD BUSINESS AND WITH SALES TAX AND MTL OH)	$ 27,181	$ 0	$ 0	$ 0
BUDGETED & RECOVERED EXPENSED COSTS				
TOTAL RECOVERED EXPENSED COST (AFTER % DOD BUSINESS)	$ 0	$ 0	$ 0	$ 0
UNRECOVERED EXPENSE COSTS				
TOTAL NON RECOVERED EXPENSED COST	$ 11,698	$ 0	$ 0	$ 0
TOTAL EXPENSED COST	$ 11,698	$ 0	$ 0	$ 0
TOTAL INVESTMENT	$ 38,879	$ 0	$ 0	$ 0
TOTAL SAVINGS (NO COMM'L)	$ 8,868	$ 27,827	$ 32,650	$ 34,338
DOD SHARE	$ 0	$ 2,035	$ 18,577	$ 25,546
OPTION3 PAYMENTS	$ 0	$ 0	$ 0	$ 0
SUBCONT SHARE OF SAVINGS (WITH OPTION 3 PAYMENTS)	$ 8,868	$ 25,792	$ 14,074	$ 8,791
DEPRECIATION (TAX)	$ 3,873	$ 5,681	$ 5,423	$ 5,423
COM RECOVERY	$ 697	$ 467	$ 226	$ (237)
SUB INCOME TAXES	$ (2,763)	$ 9,466	$ 4,083	$ 1,441
ITC	$ 2,718	$ 0	$ 0	$ 0
DEPRECIATION	$ 3,495	$ 3,495	$ 3,495	$ 3,495
SUBCONT NET CASH FLOW AFTER TAX	$ 6,842	$ 20,288	$ 13,711	$ 10,609
DISCOUNTED CASH FLOW AFTER TAX	$ (21,071)	$ (14,898)	$ 4,861	$ 11,603
SUBCONTRACTOR BEFORE TAX IRR	.00%	7.16%	29.09%	37.01%

INDUSTRIAL MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1989	1990	1991	1992
INVESTMENTS				
BUDGETED & RECOVERED CAPITAL				
COST OF CAPITALIZED LABOR	$ 0	$ 0	$ 0	$ 0
COST OF CAPITALIZED EQUIPMENT(NO TAX,OH)	$ 0	$ 0	$ 0	$ 0
COST OF CAPITALIZED OTHER (NO TAX)	$ 0	$ 0	$ 0	$ 0
TOTAL CAPITAL (AFTER % DOD BUSINESS AND WITH SALES TAX AND MTL OH)	$ 0	$ 0	$ 0	$ 0
BUDGETED & RECOVERED EXPENSED COSTS				
TOTAL RECOVERED EXPENSED COST (AFTER % DOD BUSINESS)	$ 0	$ 0	$ 0	$ 0
UNRECOVERED EXPENSE COSTS				
TOTAL NON RECOVERED EXPENSED COST	$ 0	$ 0	$ 0	$ 0
TOTAL EXPENSED COST	$ 0	$ 0	$ 0	$ 0
TOTAL INVESTMENT	$ 0	$ 0	$ 0	$ 0
TOTAL SAVINGS (NO COMM'L)	$ 35,304	$ 36,649	$ 38,842	$ 29,827
DOD SHARE	$ 31,650	$ 36,649	$ 38,842	$ 29,827
OPTION3 PAYMENTS	$ 0	$ 0	$ 0	$ 0
SUBCONT SHARE OF SAVINGS (WITH OPTION 3 PAYMENTS)	$ 3,654	$ 0	$ 0	$ 0
DEPRECIATION (TAX)	$ 5,423	$ 0	$ 0	$ 0
COM RECOVERY	$ (706)	$ (1,183)	$ (1,665)	$ (1,330)
SUB INCOME TAXES	$ (1,139)	$ (544)	$ (766)	$ (612)
ITC	$ 0	$ 0	$ 0	$ 0
DEPRECIATION	$ 3,495	$ 3,495	$ 3,495	$ 0
SUBCONT NET CASH FLOW AFTER TAX	$ 7,591	$ 2,856	$ 2,595	$ (718)
DISCOUNTED CASH FLOW AFTER TAX	$ 15,905	$ 17,352	$ 18,526	$ 18,235
SUBCONTRACTOR BEFORE TAX IRR	39.59%	40.19%	40.53%	40.36%

INDUSTRIAL MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL TMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

		TOTAL
INVESTMENTS		
BUDGETED & RECOVERED CAPITAL		
COST OF CAPITALIZED LABOR	$	13,859
COST OF CAPITALIZED EQUIPMENT(NO TAX,OH)	$	14,826
COST OF CAPITALIZED OTHER (NO TAX)	$	2,605
TOTAL CAPITAL (AFTER % DOD BUSINESS AND WITH SALES TAX AND MTL OH)	$	27,181
BUDGETED & RECOVERED EXPENSED COSTS		
TOTAL RECOVERED EXPENSED COST (AFTER % DOD BUSINESS)	$	0
UNRECOVERED EXPENSE COSTS		
TOTAL NON RECOVERED EXPENSED COST	$	11,698
TOTAL EXPENSED COST	$	11,698
TOTAL INVESTMENT	$	38,879
TOTAL SAVINGS (NO COMM'L)	$	244,306
DOD SHARE	$	183,127
OPTION3 PAYMENTS	$	0
SUBCONT SHARE OF SAVINGS (WITH OPTION 3 PAYMENTS)	$	61,179
DEPRECIATION (TAX)	$	25,822
COM RECOVERY	$	(3,731)
SUB INCOME TAXES	$	9,167
ITC	$	2,718
DEPRECIATION		
SUBCONT NET CASH FLOW AFTER TAX	$	63,763
DISCOUNTED CASH FLOW AFTER TAX	$	18,235
SUBCONTRACTOR BEFORE TAX IRR		40.36%

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1985	1986	1987	1988
DOD SHARE TOTAL BUSINESS	80.00 %	80.00 %	80.00 %	80.00 %
DOD SHARE OF SAVINGS	100.00 %	100.00 %	100.00 %	100.00 %
INSTANT F16 (COST)	$ 88	$ 393	$ 3,807	$ 142
FOLLOWON F16 (COST)	$ 0	$ 393	$ 2,993	$ 4,297
INSTANT OTHER DOD (COST)	$ 7,221	$ 20,906	$ 7,886	$ 7,159
FOLLOWON OTHER DOD (COST)	$ 0	$ 1,287	$ 12,441	$ 16,921
INSTANT F16 (SELL)	$ 106	$ 476	$ 4,583	$ 171
FOLLOWON F16 (SELL)	$ 0	$ 476	$ 3,602	$ 5,174
INSTANT OTHER DOD (SELL)	$ 8,762	$ 25,316	$ 9,491	$ 8,620
FOLLOWON OTHER DOD (SELL)	$ 0	$ 1,559	$ 14,974	$ 20,373
RECOVERED INDIRECT	$ 0	$ 0	$ 0	$ 0
RECOVERED DEPR (CAS 409)	$ 3,495	$ 3,495	$ 3,495	$ 3,495
UNRECOVERED INDIRECT	$ 11,698	$ 0	$ 0	$ 0
DEPRECIATION (TAX)	$ 3,873	$ 5,681	$ 5,423	$ 5,423

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	1989	1990	1991	1992
DOD SHARE TOTAL BUSINESS	80.00 %	80.00 %	80.00 %	80.00 %
DOD SHARE OF SAVINGS	100.00 %	100.00 %	100.00 %	100.00 %
INSTANT F16 (COST)	$ 0	$ 0	$ 0	$ 0
FOLLOWON F16 (COST)	$ 5,763	$ 6,754	$ 7,157	$ 5,081
INSTANT OTHER DOD (COST)	$ 3,035	$ 0	$ 0	$ 0
FOLLOWON OTHER DOD (COST)	$ 20,525	$ 23,686	$ 25,104	$ 19,692
INSTANT F16 (SELL)	$ 0	$ 0	$ 0	$ 0
FOLLOWON F16 (SELL)	$ 6,938	$ 8,132	$ 8,617	$ 6,117
INSTANT OTHER DOD (SELL)	$ 3,654	$ 0	$ 0	$ 0
FOLLOWON OTHER DOD (SELL)	$ 24,712	$ 28,518	$ 30,226	$ 23,710
RECOVERED INDIRECT	$ 0	$ 0	$ 0	$ 0
RECOVERED DEPR (CAS 409)	$ 3,495	$ 3,495	$ 3,495	$ 0
UNRECOVERED INDIRECT	$ 0	$ 0	$ 0	$ 0
DEPRECIATION (TAX)	$ 5,423	$ 0	$ 0	$ 0

INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM
INTERNAL RATE OF RETURN MODEL RESULTS
(MODEL IMIRR5 USING CMASSY9)

COUNTERMEASURES ASSEMBLY IMPROVEMENTS

	TOTAL
DOD SHARE TOTAL BUSINESS	
DOD SHARE OF SAVINGS	
INSTANT F16 (COST)	$ 4,431
FOLLOWON F16 (COST)	$ 32,437
INSTANT OTHER DOD (COST)	$ 46,207
FOLLOWON OTHER DOD (COST)	$ 119,657
INSTANT F16 (SELL)	$ 5,337
FOLLOWON F16 (SELL)	$ 39,056
INSTANT OTHER DOD (SELL)	$ 55,843
FOLLOWON OTHER DOD (SELL)	$ 144,071
RECOVERED INDIRECT	$ 0
RECOVERED DEPR (CAS 409)	$ 24,463
UNRECOVERED INDIRECT	$ 11,698
DEPRECIATION (TAX)	$ 25,822

```
ELEMENT IFPSMJ.CMASSY9 01/06/86 12:58
MICRO &PROJECT&COUNTERMEASURES ASSEMBLY IMPROVEMENTS&
MICRO &YEARS&1985,1986,1987,1988,1989,1990,1991,1992,TOTAL&
MICRO &COLUMNS&8&
MICRO &COLUMNS-1&7&
SALES TAX RATE = .05125
COST OF CAPITALIZED LABOR = 13859,0
COST OF CAPITALIZED EQUIPMENT = 14826,0
COST OF CAPITALIZED OTHER = 2605,0
NON RECOVERED CAPITALIZED COSTS = 0
RECOVERED EXPENSED COSTS = 0
NONRECOVERED EXPENSED COSTS = 14623,0
F SIX INSTANT DIRECT DOLLAR SAVINGS = 31,139,1379,52,0
F SIX FOLLOW ON DIRECT DOLLAR SAVINGS = 0,139,1084,1569,2104,2466,2613,1855
OTHER DOD INSTANT DIRECT DOLLAR SAVINGS = 2553,7390,2856,2614,1108,0
OTHER DOD FOLLOW ON DIRECT DOLLAR SAVINGS = 0,455,4506,6178,7494,'
6648,9165,7190
GOVT INSTANT DIRECT DOLLAR SAVINGS = 2584,7529,4235,2666,1108,0
COMMERCIAL DIRECT DOLLAR SAVINGS = 385,2370,1579,1673,2105,2466,2613,1855
GOVT FOLLOW ON DIRECT DOLLAR SAVINGS = 0,594,5590,7747,'
9598,11114,11779,9045
DIRECT VARIABLE LABOR DOLLARS SAVED = 1
DIRECT FIXED LABOR DOLLARS SAVED = 0
AVERAGE DIRECT LABOR RATE = 1
MFG RATE = 1.450,1.420,1.37,1.355
ENG RATE = 0
MH RATE = .105
MFG COM RATE =.16178,.15182,.13292
ENG COM RATE = 0
MH COM RATE = 0
GA RATE =.1545,.1690,.1650,.1630
GA COM RATE = .00713,.00849,.00636
FEE RATE = .15
EQUIPMENT LIFE = 5
INSTANT DOD FACTOR = 0
DOD FACTOR = 1
COM FACTOR = .10375
INCOME TAX RATE = .46
ITC RATE = .1
DISCOUNT RATE = .12
PER CENT DOD BUSINESS = .8
YEAR = 1985,PREVIOUS + 1
```

```
EQUIP LIFE SL = 7
MATERIAL COST SAVED = 0
OPTION3 PAYMENTS = 0
MH =.115,0
END OF DATAFILE
```

THIS MODEL WAS CREATED TO ANALYZE CAPITAL INVESTMENTS REGUARDING
THE INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM (TECH MOD).

YEART	1985	1986	1987	1988	1989	1990
DATA ELEMENTS SECTION						
SALES TAX RATE	.0513	.0513	.0513	.0513	.0513	.0513
COST OF CAPITALIZED LABO	13859	0	0	0	0	0
COST OF CAPITALIZED EQUI	14826	0	0	0	0	0
COST OF CAPITALIZED OTHE	2605	0	0	0	0	0
SALES TAX M	759.8	0	0	0	0	0
SALES TAX C	133.5	0	0	0	0	0
MATERIAL HANDLING C	1792	0	0	0	0	0
NON RECOVERED CAPITALIZE	0	0	0	0	0	
RECOVERED EXPENSED COSTS	0	0	0	0	0	0
NONRECOVERED EXPENSED CO	14623	0	0	0	0	0
MATERIAL COST SAVED	0	0	0	0	0	0
F SIX INSTANT DIRECT DOL	31	139	1379	52	0	0
F SIX FOLLOW ON DIRECT D	0	139	1084	1569	2104	2466
OTHER DOD INSTANT DIRECT	2553	7390	2856	2614	1108	0
OTHER DOD FOLLOW ON DIRE	0	455	4506	6178	7494	8648
GOVT INSTANT DIRECT DOLL	2584	7529	4235	2666	1108	0
COMMERCIAL DIPECT DOLLAR	385	2370	1579	1673	2105	2466
GOVT FOLLOW ON DIRECT DO	0	594	5590	7747	9598	11114
DIRECT VARIABLE LABOR DO	1	1	1	1	1	1
DIRECT FIXED LABOR DOLLA	0	0	0	0	0	0
AVERAGE DIRECT LABOR RAT	1	1	1	1	1	1
MFG RATE	1.450	1.420	1.370	1.355	1.355	1.355
ENG RATE	0	0	0	0	0	0
MH RATE	.1050	.1050	.1050	.1050	.1050	.1050
MH	.1150	0	0	0	0	0

MH COM RATE	0	0	0	0	0	0
GA RATE	.1545	.1690	.1650	.1630	.1630	.1630
GA COM RATE	.0071	.0085	.0064	.0064	.0064	.0064
EQUIP LIFE SL	7	7	7	7	7	7
FEE RATE	.1500	.1500	.1500	.1500	.1500	.1500
EQUIPMENT LIFE	5	5	5	5	5	5
INSTANT DOD FACTOR	0	0	0	0	0	0
DOD FACTOR	1	1	1	1	1	1
OPTIONS PAYMENTS	0	0	0	0	0	0
COM FACTOR	.1038	.1038	.1038	.1038	.1038	.1038
INCOME TAX RATE	.4600	.4600	.4600	.4600	.4600	.4600
ITC RATE	.1000	.1000	.1000	.1000	.1000	.1000
DISCOUNT RATE	.1200	.1200	.1200	.1200	.1200	.1200
PER CENT DOD BUSINESS	.8000	.8000	.8000	.8000	.8000	.8000
**********INVESTMENT**********						
TOTAL BUDGETED CAPITAL	27181	0	0	0	0	0
TOTAL NONRECOVERED CAPIT	0	0	0	0	0	0
TOTAL RECOVERED EXPENSED	0	0	0	0	0	0
TOTAL NON RECOVERED EXPE	11698	0	0	0	0	0
RECOVERED DEPRECIATION	3495	3495	3495	3495	3495	3495
TOTAL RECOVERED INVESTME	3495	3495	3495	3495	3495	3495
TOTAL NON RECOVERED INVE	35384	-3495	-3495	-3495	-3495	-3495
TOTAL CAPITAL	27181	0	0	0	0	0
TOTAL EXPENSED COST	11698	0	0	0	0	0
TOTAL INVESTMENT	38879	0	0	0	0	0
*******SAVINGS**********						
RATIO CALCULATIONS						
TOTAL VARIABLE LABOR DIR	2969	10493	11404	12086	12811	13580
COMMERCIAL RATIO	.1297	.2259	.1385	.1384	.1643	.1916
GOVT INSTANT RATIO	.8703	.7175	.3714	.2206	.0865	0
GOVT FOLLOW ON RATIO	0	.0566	.4902	.6410	.7492	.8184
F SIX INSTANT RATIO	.0120	.0185	.3256	.0195	0	0
F SIX FOLLOW ON RATIO	0	.2340	.1939	.2025	.2192	.2219
OTHER DOD INSTANT RATIO	.9880	.9815	.6744	.9805	1	0
OTHER DOD FOLLOW ON RATI	0	.7660	.8061	.7975	.7808	.7781
LABOR COST SAVINGS						
TOTAL DIRECT LABOR DOLLA	2969	10493	11404	12086	12811	13580
TOTAL DIRECT SAVED	2969	10493	11404	12086	12811	13580
LOADED AVERAGE DIRECT LA	2.829	2.829	2.761	2.739	2.739	2.739
LOADED DIRECT LABOR SAVE	8930	31493	33175	34889	36982	39202
COM ON MFG DIRECT LABOR	480.3	1593	1516	1606	1703	1805

MAT SAVED	0	0	0	0	0	0
COM ON MATL COST SAVED	0	0	0	0	0	0
COST OF MONEY						
GA COM FOR LABOR	51.86	215.6	171.9	181.0	191.9	203.4
GA COM FOR MATERIAL	0	0	0	0	0	0
TOTAL COST OF MONEY SAVE	532.2	1809	1688	1787	1895	2008
COM ON CAPITAL	1229	2276	1914	1551	1188	825.9
COM RECOVERY	696.5	467.5	225.8	-236.5	-706.3	-1183
SAVINGS BY CUSTOMER						
TOTAL DIRECT SAVINGS	2969	10493	11404	12086	12811	13580
TOTAL COST SAVINGS	8398	29684	31487	33102	35088	37194
TOTAL OVERHEAD SAVED	5429	19191	20093	21016	22277	23614
TOTAL SAVINGS TO SELL	10190	35946	37898	39855	42245	44781
TOTAL FEE	1792	6261	6411	6753	7158	7588
COMMERCIAL LOADED SAVING	1089	6705	4360	4582	5765	6754
COMMERCIAL SAVINGS TO SE	1321	8119	5247	5517	6941	8132
COMMERCIAL GROSS FEE	232.4	1414	887.6	934.8	1176	1378
GOVT INSTANT LOADED SAVI	7309	21299	11693	7302	3035	0
GOVT INSTANT SAVINGS TO	8368	25792	14074	8791	3654	0
GOVT INSTANT GROSS FEE	1560	4493	2391	1490	619.1	0
GOVT FOLLOW ON LOADED SA	0	1680	15434	21218	26288	30440
GOVT FOLLOW ON SAVINGS T	0	2035	18577	25546	31650	36649
GOVT FOLLOW ON GROSS FEE	0	354.4	3142	4328	5363	6210
F SIX INSTANT LOADED SAV	87.68	393.2	3807	142.4	0	0
F SIX INSTANT SAVINGS TO	106.4	476.2	4583	171.5	0	0
F SIX INSTANT GROSS FEE	18.71	82.94	775.2	29.05	0	0
F SIX FOLLOW ON LOADED S	0	393.2	2993	4297	5763	6754
F SIX FOLLOW ON SAVINGS	0	476.2	3602	5174	6938	8132
F SIX FOLLOW ON GROSS FE	0	82.94	609.4	876.6	1176	1378
OTHER DOD INSTANT LOADED	7221	20906	7886	7159	3035	0
OTHER DOD INSTANT SAVING	8762	25316	9491	8620	3654	0
OTHER DOD INSTANT GROSS	1541	4410	1606	1461	619.1	0
OTHER DOD FOLLOW ON LOAD	0	1287	12441	16921	20525	23686
OTHER DOD FOLLOW ON SAVI	0	1559	14974	20373	24712	28518
OTHER DOD FOLLOW ON GROS	0	271.5	2533	3452	4187	4832
DEPRECIATION						
NET DEPRECIABLE COST	25822	0	0	0	0	0
ACC DEPRECIATION	3973	5681	5423	5423	5423	0
BOOK VALUE	21948	16268	10845	5423	0	0
CUMULATIVE DEPRECIATION	3873	9554	14976	20399	25822	25822
ACCEL DEPRECIATION	3873	5681	5423	5423	5423	0
DEPRECIATION	3495	3495	3495	3495	3495	3495

CUMULATIVE DEPR						
TOTAL SL DEPRECIATION	3495	3495	3495	3495	3495	3495
DEFERRED DEPRECIATION	378.6	2186	1928	1928	1928	-3495
CAPITAL COM BASE	11843	21939	18444	14949	11455	7960
NBV CAPITAL	0	0	0	0	0	0

********** SCHEDULE 3

PROD SAVINGS REWARD

INSTANT F SIX	106.4	476.2	4593	171.5	0	0
FOLLOW ON F SIX	0	0	0	0	0	0
INSTANT OTHER DOD	8762	25316	9491	8620	3654	0
FOLLOW ON OTHER DOD	0	0	0	0	0	0
PSR TO SELL TOTAL	8868	25792	14074	8791	3654	0
DOD SHARE						
DOD SHARE INSTANT F SIX	0	0	0	0	0	0
F SIX DOD SHARE	0	476.2	3602	5174	6938	8132
DOD SHARE INSTANT OTHER	0	0	0	0	0	0
OTHER DOD SHARE	0	1559	14974	20373	24712	28518
DOD TO SELL TOTAL	0	2035	13577	25546	31650	36649
TOTAL SAVINGS TO SELL						
INSTANT F	106.4	476.2	4593	171.5	0	0
FOLLOW ON F	0	476.2	3602	5174	6938	8132
INSTANT OTHER	8762	25316	9491	8620	3654	0
OTHER FOLLOW ON	0	1559	14974	20373	24712	28518
TOTAL SAVINGS	8868	27827	32650	34338	35304	36649
DOD SHARE	0	2035	18577	25546	31650	36649
SUBCONTRACTOR SHARE	8868	25792	14074	8791	3654	0
LOST PROFIT ON SAVINGS	0	354.4	3142	4328	5363	6210
SUB SHARE	8868	25438	10931	4463	-1709	-6210
SUBC TOTAL SAVINGS	10190	33911	19321	14308	10595	8132
INCOME TAXES						
ITC	2718	0	0	0	0	0
SUB INCOME TAXES	-2763	9466	4093	1441	-1139	-544.0
LP VERSION TAXES	-2763	9303	2638	-550.2	-3605	-3400
DEFFERED TAXES	174.1	1006	886.8	886.8	886.8	-1608
SUBCONTRACTOR INCOME AFT	3348	16793	10216	7114	4086	-638.6

SUBCONTRACTOR NET INCOME AFTER TAX

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

**********CASH FLOW**********

CASH INFLOW PRE TAX	1361	29754	17794	12050	6442	2312
CASH INFLOW AFTER TAX	6842	20288	13711	10609	7581	2856
LP INFLOW AFTER TAX	18018	20635	12675	9395	6278	-922.1
CUMMULATIVE CASH INFLOW	1361	31115	48910	60959	67401	69713
CUMMULATIVE CASH INFLOW	6842	27130	40841	51450	59030	61886
CUMMULATIVE LP INFLOW AF	18018	38653	51328	60722	67000	66078

DISCOUNTED CASH FLOW

NPV PRE TAX	-25965	-2245	10420	18078	21733	22905
NPV AFTER TAX	-21071	-4898	4861	11603	15905	17352
LP NPV AFTER TAX	-11093	5357	14379	20349	23911	23444
SUBCONTRACTOR BEFORE TAX	0	7.161	29.09	37.01	39.58	40.19
SUBCONTRACTOR AFTER TAX	0	0	21.15	30.09	33.94	34.90
LP AFTER TAX IRR	0	26.37	42.52	48.83	51.26	51.04
YEAR	1985	1986	1987	1988	1989	1990

**********TOTALING**********

THIS MODEL WAS CREATED TO ANALYZE CAPITAL INVESTMENTS REGUARDING
THE INDUSTRIAL TECHNOLOGY MODERNIZATION PROGRAM (TECH MOD).

YEART	1991	1992	
DATA ELEMENTS SECTION			
SALES TAX RATE	.0513	.0513	
COST OF CAPITALIZED LABO	0	0	13859
COST OF CAPITALIZED EQUI	0	0	14826
COST OF CAPITALIZED OTHE	0	0	2605
SALES TAX M	0	0	759.8
SALES TAX C	0	0	133.5
MATERIAL HANDLING C	0	0	1792
NON RECOVERED CAPITALIZE	0	0	0
RECOVERED EXPENSED COSTS	0	0	0
NONRECOVERED EXPENSED CO	0	0	14623
MATERIAL COST SAVED	0	0	0
F SIX INSTANT DIRECT DOL	0	0	1601
F SIX FOLLOW ON DIRECT D	2613	1855	11830
OTHER DOD INSTANT DIRECT	0	0	16521

GOVT INSTANT DIRECT DOLL	0	0	18122
COMMERCIAL DIRECT DOLLAR	2613	1855	15046
GOVT FOLLOW ON DIRECT DO	11779	9045	55467
DIRECT VARIABLE LABOR DO	1	1	
DIRECT FIXED LABOR DOLLA	0	0	
AVERAGE DIRECT LABOR RAT	1	1	
MFG RATE	1.355	1.355	
ENG RATE	0	0	
MH RATE	.1050	.1050	
MH	0	0	
MFG COM RATE	.1329	.1329	
ENG COM RATE	0	0	
MH COM RATE	0	0	
GA RATE	.1630	.1630	
GA COM RATE	.0064	.0064	
EQUIP LIFE SL	7	7	
FEE RATE	.1500	.1500	
EQUIPMENT LIFE	5	5	
INSTANT DOD FACTOR	0	0	
DOD FACTOR	1	1	
OPTIONS PAYMENTS	0	0	0
COM FACTOR	.1038	.1038	
INCOME TAX RATE	.4600	.4600	
ITC RATE	.1000	.1000	
DISCOUNT RATE	.1200	.1200	
PER CENT DOD BUSINESS	.8000	.8000	

**********INVESTMENT**********

TOTAL BUDGETED CAPITAL	0	0	27181
TOTAL NONRECOVERED CAPIT	0	0	0
TOTAL RECOVERED EXPENSED	0	0	0
TOTAL NON RECOVERED EXPE	0	0	11690
RECOVERED DEPRECIATION	3495	0	24463
TOTAL RECOVERED INVESTME	3495	0	24463
TOTAL NON RECOVERED INVE	-3495	0	14416
TOTAL CAPITAL	0	0	27181
TOTAL EXPENSED COST	0	0	11698
TOTAL INVESTMENT	0	0	38879

*******SAVINGS**********

RATIO CALCULATIONS

TOTAL VARIABLE LABOR DIR	14392	10900
COMMERCIAL RATIO	.1816	.1702
GOVT INSTANT RATIO	0	0
GOVT FOLLOW ON RATIO	.8184	.8298
F SIX INSTANT RATIO	0	0
F SIX FOLLOW ON RATIO	.2219	.2051

OTHER DOD FOLLOW ON RATE	.7782	.7949	
LABOR COST SAVINGS			
TOTAL DIRECT LABOR DOLLA	14392	10900	88635
TOTAL DIRECT SAVED	14392	10900	88635
LOADED AVERAGE DIRECT LA	2.739	2.739	
LOADED DIRECT LABOR SAVE	41546	31466	257684
COM ON MFG DIRECT LABOR	1913	1449	
MATERIAL COST SAVINGS			
LOADED MATERIAL COST SAV	0	0	0
MAT SAVED	0	0	0
COM ON MATL COST SAVED	0	0	
COST OF MONEY			
GA COM FOR LABOR	215.6	163.3	1394
GA COM FOR MATERIAL	0	0	0
TOTAL COST OF MONEY SAVE	2129	1612	13460
COM ON CAPITAL	463.3	282.0	9729
COM RECOVERY	-1665	-1330	-3731
SAVINGS BY CUSTOMER			
TOTAL DIRECT SAVINGS	14392	10900	88635
TOTAL COST SAVINGS	39418	29854	244224
TOTAL OVERHEAD SAVED	25026	18954	155589
TOTAL SAVINGS TO SELL	47459	35944	294318
TOTAL FEE	8041	6090	50093
COMMERCIAL LOADED SAVING	7157	5081	41492
COMMERCIAL SAVINGS TO SE	8617	6117	50011
COMMERCIAL GROSS FEE	1460	1036	8519
GOVT INSTANT LOADED SAVI	0	0	50638
GOVT INSTANT SAVINGS TO	0	0	61179
GOVT INSTANT GROSS FEE	0	0	10542
GOVT FOLLOW ON LOADED SA	32261	24773	152094
GOVT FOLLOW ON SAVINGS T	38842	29827	183127
GOVT FOLLOW ON GROSS FEE	6581	5054	31033
F SIX INSTANT LOADED SAV	0	0	4431
F SIX INSTANT SAVINGS TO	0	0	5337
F SIX INSTANT GROSS FEE	0	0	905.9
F SIX FOLLOW ON LOADED S	7157	5081	32437
F SIX FOLLOW ON SAVINGS	8617	6117	39056
F SIX FOLLOW ON GROSS FE	1460	1036	6619
OTHER DOD INSTANT LOADED	0	0	46207
OTHER DOD INSTANT SAVING	0	0	55843
OTHER DOD INSTANT GROSS	0	0	9636
OTHER DOD FOLLOW ON LOAD	25104	19692	119657

DEPRECIATION			
NET DEPRECIABLE COST	0	0	
ACC DEPRECIATION	0	0	
BOOK VALUE	0	0	
CUMULATIVE DEPRECIATION	25822	25822	
ACCEL DEPRECIATION	0	0	25822
DEPRECIATION	3495	0	
BOOK VAL	2718	2718	
CUM DEPRECIATION	24463	24463	
DEPR			
BK VALUE			
CUMULATIVE DEPR			
TOTAL SL DEPRECIATION	3495		24463
DEFERRED DEPRECIATION	-3495		1359
CAPITAL COM BASE	4465	2718	
NBV CAPITAL	0	0	
********** SCHEDULE B			
PROD SAVINGS REWARD			
INSTANT F SIX	0	0	5337
FOLLOW ON F SIX	0	0	0
INSTANT OTHER DOD	0	0	55843
FOLLOW ON OTHER DOD	0	0	0
PSR TO SELL TOTAL	0	0	61179
DOD SHARE			
DOD SHARE INSTANT F SIX	0	0	0
F SIX DOD SHARE	8617	6117	39056
DOD SHARE INSTANT OTHER	0	0	0
OTHER DOD SHARE	30226	23710	144071
DOD TO SELL TOTAL	38842	29827	183127
TOTAL SAVINGS TO SELL			
INSTANT F	0	0	5337
FOLLOW ON F	8617	6117	39056
INSTANT OTHER	0	0	55843
OTHER FOLLOW ON	30226	23710	144071
TOTAL SAVINGS	38842	29827	244306
DOD SHARE	38842	29827	183127
SUBCONTRACTOR SHARE	0	0	61179
COST PROFIT ON SAVINGS	6581	5054	31033
SUB SHARE	-6581	-5054	30147

INCOME TAXES

ITC	0	0	2718
SUB INCOME TAXES	-766.0	-611.8	9167
LP VERSION TAXES	-3793	-2937	-5108
DEFFERED TAXES	-1608	0	625.2
SUBCONTRACTOR INCOME AFT	-899.2	-718.2	39301
SUBCONTRACTOR NET INCOME AFTER TAX			
SUBC NET INCOME AFTER TA	-899.2	-718.2	13479
LP A T SAVINGS	-2788	-2117	37973

**********CASH FLOW**********

CASH INFLOW PRE TAX	1829	-1330	70213
CASH INFLOW AFTER TAX	2595	-718.2	63763
LP INFLOW AFTER TAX	-900.7	-2117	63060
CUMMULATIVE CASH INFLOW	71543	70213	
CUMMULATIVE CASH INFLOW	64482	63763	
CUMMULATIVE LP INFLOW AF	65177	63060	
DISCOUNTED CASH FLOW			
NPV PRE TAX	23732	23195	23195
NPV AFTER TAX	18526	18235	18235
LP NPV AFTER TAX	23037	22182	22182
SUBCONTRACTOR BEFORE TAX	40.53	40.36	40.36
SUBCONTRACTOR AFTER TAX	35.52	35.39	35.39
LP AFTER TAX IRR	50.89	50.66	50.66
YEAR	1991	1992	

**********TOTALING**********

THE FIRST YEAR IN WHICH INPUTS WILL BE MADE IS*** 1985 ***

CAPITAL EQUIPMENT COSTS?—>	27181 <——	***LATEST RATES***	
		MTL—>	0.000
		MFG—>	0.000
DOD SHARE TOTAL BUSINESS?—>	1.00 <——	ENG—>	0.000
		G&A—>	0.000
DOD SHARE OF SAVINGS ****	1.00 ***	OTH—>	0.000
		PROFIT>	0.000
		COM—>	0.000

MANUFACTURING HOURLY RATE		ENGINEERING HOURLY RATE	
1985	0.00 <<—	1985	0.00 <<—
1986	0.00 <<—	1986	0.00 <<—
1987	0.00 <<—	1987	0.00 <<—
1988	0.00 <<—	1988	0.00 <<—
1989	0.00 <<—	1989	0.00 <<—
1990	0.00 <<—	1990	0.00 <<—
1991	0.00 <<—	1991	0.00 <<—
1992	0.00 <<—	1992	0.00 <<—
1993	0.00 <<—	1993	0.00 <<—
1994	0.00 <<—	1994	0.00 <<—

ENTER DOD SHARE—>>	1.00 <<—	RESULTING DOD NPV***	81274
DOD DISCOUNT FACTOR>	0.12 <<—	RESULTING VND IRR***	0.498
VENDOR DISC FACTOR>>	0.35 <<—	RESULTING VND NPV***	3108

YEAR	VENDOR CAPITAL	PSR
1985	-21946	8868
1986	18680	25792
1987	12104	14074
1988	9001	8791
1989	5974	3654
1990	1248	0
1991	988	0
1992	-718	0
1993	0	0
1994	0	0
TOTAL	25332	61179

YEAR	DOD SAVINGS
1985	-3495
1986	-1460
1987	15081
1988	22052
1989	28155
1990	33155
1991	35348
1992	29827
1993	0
1994	0
TOTAL	158663

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SCHEDULE A1 FORECASTED INSTANT F-16 SAVINGS
-ALT W-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
2. MANUFACTURING HOURS											
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. SAVINGS THRU G&A	88	393	3807	142	0	0	0	0	0	0	4430

SCHEDULE A2 FORECASTED F/O F-16 SAVINGS
-ALT X-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0										0
2. MANUFACTURING HOURS											
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. SAVINGS THRU G&A	0	393	2993	4297	5763	6754	7157	5081	0	0	32438

CHEDULE A3 FORECASTED INSTANT OTHER DOD SAVINGS
-ALT Y-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0										0
2. MANUFACTURING HOURS											0
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											0
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. SAVINGS THRU G&A	7221	20906	7886	7159	3035	0	0	0	0	0	46207

SCHEDULE A4 FORECASTED F/O OTHER DOD SAVINGS
-ALT Z-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0										0
2. MANUFACTURING HOURS											
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. SAVINGS THRU G&A	0	1287	12441	16921	20525	23686	25104	19692	0	0	119656

SCHEDULE A BY ELEMENT SAVINGS SUMMARY TO COST
-ALT A-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
2. MANUFACTURING HOURS	0	0	0	0	0	0	0	0	0	0	0
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4. TOTAL MFG LABOR	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS	0	0	0	0	0	0	0	0	0	0	0
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7. TOTAL ENG LABOR	0	0	0	0	0	0	0	0	0	0	0
8. *OTHER (SPECIFY)*											
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. SAVINGS THRU C&A	0	0	0	0	0	0	0	0	0	0	0

SCEDULE B TOTAL SAVINGS BY PROGRAM TO SELL
-ALT B-

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
PROD SAVINGS REWARD												
1. INSTANT F-16		106	476	4583	171	0	0	0	0	0	0	5336
2. F/O F-16		0	476	3602	5174	6938	8132	8617	6117	0	0	39056
3. INSTANT OTHER DOD		8762	25316	9491	8620	3654	0	0	0	0	0	55843
4. F/O OTHER DOD		0	1559	14974	20373	24712	28518	30226	23710	0	0	144072
5. SUBTOTAL		8868	27827	32650	34338	35304	36650	38843	29827	0	0	244307
DOD SHARE												
6. INSTANT F-16		106	476	4583	171	0	0	0	0	0	0	5336
7. F/O F-16		0	476	3602	5174	6938	8132	8617	6117	0	0	39056
8. INSTANT OTHER DOD		8762	25316	9491	8620	3654	0	0	0	0	0	55843
9. F/O OTHER DOD		0	1559	14974	20373	24712	28518	30226	23710	0	0	144072
10. SUBTOTAL		8868	27827	32650	34338	35304	36650	38843	29827	0	0	244307
TOTAL SAVINGS												
11. INSTANT F-16	(SCH A1)	106	476	4583	171	0	0	0	0	0	0	5336
12. F/O F-16	(SCH A2)	0	476	3602	5174	6938	8132	8617	6117	0	0	39056
13. INSTANT OTHER DOD	(SCH A3)	8762	25316	9491	8620	3654	0	0	0	0	0	55843
14. F/O OTHER DOD	(SCH A4)	0	1559	14974	20373	24712	28518	30226	23710	0	0	144072
15. TOTAL		8868	27827	32650	34338	35304	36650	38843	29827	0	0	244307

SCHEDULE C RECOVERED FORECASTED EXPENSES/INVESTMENT
-ALT C-

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS											0
2. MANUFACTURING HOURS											0
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											0
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											0
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	0	0	0	0	0	0	0	0	0	0	0
16. DEPRECIATION (CAS409)	3495	3495	3495	3495	3495	3495	3495				24465
17. TOTAL RECOVERED	3495	3495	3495	3495	3495	3495	3495	0	0	0	24465

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SCHEDULE D
-ALT D-

UNRECOVERED FORECASTED EXPENSES/INVESTMENT

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. MATERIALS	0										0
2. MANUFACTURING HOURS											
3. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
5. ENGINEERING HOURS											
6. *HOURLY RATE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7. SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY)											0
9. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0
10. MATERIALS	0	0	0	0	0	0	0	0	0	0	0
11. MANUFACTURING	0	0	0	0	0	0	0	0	0	0	0
12. ENGINEERING	0	0	0	0	0	0	0	0	0	0	0
13. OTHER (SPECIFY)	0	0	0	0	0	0	0	0	0	0	0
14. GEN & ADMN	0	0	0	0	0	0	0	0	0	0	0
15. TOTAL INDIRECT	11698	0	0	0	0	0	0	0	0	0	11698
16. DEPRECIATION (CAS409)	0										
17. TOTAL UNRECOVERED	11698	0	0	0	0	0	0	0	0	0	11698

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SCHEDULE E FORECASTED SUBCONTRACTOR NET INCOME
-ALT E-

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. GROSS SAVINGS	(SCH B)	8868	27827	32650	34338	35304	36650	38843	29827	0	0	244307
2. LESS EXPENSES AT SELL	(SCH C)	3495	3495	3495	3495	3495	3495	3495	0	0	0	24465
3. SAVINGS AVAILABLE		5373	24332	29155	30843	31809	33155	35348	29827	0	0	219842
4. LESS: DOD SHARE		-3495	-1460	15081	22052	28155	33155	35348	29827	0	0	158663
5. PROD SAVINGS RWD		8868	25792	14074	8791	3654	0	0	0	0	0	61179
6. LESS: EXPENSES	(SCH D)	11698	0	0	0	0	0	0	0	0	0	11698
7. ADD: PROF/COM ON SCH C		0	0	0	0	0	0	0	0	0	0	0
8. OTHER (SPECIFY +/-)		697	467	226	-237	-706	-1183	-1665	-1330			-3731
9. CONTRACTOR TAXABLE INCOME		-2133	26259	14300	8554	2948	-1183	-1665	-1330	0	0	45750
10. LESS: CORP TAX? 0.46		-981	12079	6578	3935	1356	-544	-766	-612	0	0	21045
11. ADD: INVEST TAX CREDIT		2718										2718
CAPITAL COSTS? 27181												
%DOD BUSINESS? 1.00												
12. SUBCONTRACTOR NET INCOME		1566	14180	7722	4619	1592	-639	-899	-718	0	0	27423
13. DEPRECIATION (TAX)		3873	5681	5423	5423	5423	0					25823
14. DEFERRED TAXES		174	1006	887	887	887	-1608	-1608	0	0	0	625

SCHEDULE F SCHEDULE OF FORECASTED AFTER TAX CASH FLOW
-ALT F-

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
1. ADD: NET INCOME	(SCH E)	1566	14180	7722	4619	1592	-639	-899	-718	0	0	27423
2. DEPRECIATION (CAS 409)	(SCH C/D)	3495	3495	3495	3495	3495	3495	3495	0	0	0	24465
3. DEFERRED TAXES	(SCH E)	174	1006	887	887	887	-1608	-1608	0	0	0	625
4. NBV OF DISPOSABLE F/A												0
5. OTHER (SPECIFY)												0
6. LESS: CAPITAL INVESTMENT		27181										27181
7. OTHER (SPECIFY)												0
8. AFTER TAX CASH FLOW		-21946	18680	12104	9001	5974	1248	988	-718	0	0	25332
9. CUMULATIVE ATC FLOW		-21946	-3265	8838	17840	23813	25062	26050	25332	25332	25332	25332

10. WITH A DISCOUNT FACTOR ==> 0.1200 <=NPV IS** 13812 **

11. SUBCONTRACTOR IRR 0.4977
GUESS? 0.50

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